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THE COURSE OF STUDY

A PUBLICATION FOR TEACHERS AND PARENTS

ISSUED MONTHLY—TEN NUMBERS A YEAR.

The Behavior of Swamp Plants

Otis W. Caldwell

EASTERN ILLINOIS STATE NORMAL SCHOOL

The definite relations that exist between plants and the conditions which surround them are of constant interest to those persons who see plants as things which are alive and performing work. One set of conditions makes possible a type of plant life which type must be adopted in a general way, at least by all the plants living among these conditions. That this type is adopted in a general way only is clearly shown by the fact that no two plants, even of the nearest kin, are exactly alike, no matter how nearly identical the conditions which affect them. Plants which live in water need certain structures which plants living on dry land do not need; and those living on the land of the upward slopes of high mountains, to be successful, must have some structures not found among plants living in the valleys below. As an outcome of these diverse conditions we have certain groups of plants which we recognize as mountain-slope plants; certain groups which are valley plants, and others recognized as water plants. Furthermore, some water plants live entirely beneath the water's surface, while others have their leaves floating or standing above the water. Thus we have a group of submerged water plants and a group of floating ones, each group needing structures peculiar to the demands of the conditions which surround it. These various environments have given rise to "plant societies." By this it is not meant that plants of nearest kin nor of greatest resemblances are associated, but those which have been able to respond to a particular environment by developing the structures needed for successful growth in that environment. Any given plant society usually contains species of plants widely separated in relationship, rather than those of closely related families.

A large community in which all the men are blacksmiths would not prosper, since all would demand the same kind of support. Communities of men prosper best when some of the men are blacksmiths, some are merchants, some physicians, and others working in various other lines, thus obtaining their support from the community in a variety of ways. Likewise, if in the plant society all the individuals were alike, or even of the same species, all could not be indefinitely supplied with the necessities of life. But with some kinds of plants needing certain soil and water elements, and other kinds needing other things, the members of the society live together and prosper fairly well, since all do not demand the same thing from the soil or water in which they grow. Notwithstanding this fact of the usual diversity of individuals in a plant society, there are many cases of massing

FIG. 1. A rock cliff where plants are fighting for their lives by trying to hold the soil. Where there are no plant roots the soil is readily removed by the action of water.

of members of a single species to the exclusion of all others. Such conditions are well illustrated in some pine and water lily societies.

As suggested above, the conditions of soil, water, air, and other elements of a given region have very much to do with determining the structure of the plants living in that region. On the other hand, the plants have much to do with determining the environment. This is admirably illustrated by a consideration of some of the morainic swamp regions, many of which are to be found in various places throughout the country formerly covered by the glaciers. At the time of the deposition of the terminal moraines left by the rapid recession of the great glaciers, there were formed basins of various sizes, many of which were left with no natural means of drainage, and consequently became ponds or lakes. During the earlier part of the life of these ponds or lakes, the water from the higher surrounding regions ran down the slopes, and as it ran, broke loose and carried with it parts of the earth or stone over which it flowed. These materials carried down by the water were deposited in the bottom of the pond, and by this filling process contributed greatly toward removing the body of water.

When the pond was comparatively young, however, the plants became established in all these regions, whose alteration affected the size, shape, and depth of the basin; and with the advent of these plants came some interesting occurrences in the life history of the pond. The plants which grow on the surrounding land send their roots deep into the soil as well as throughout its surface. Soon the soil is

filled with mats of roots which serve to hold it and to keep it from being carried away by the action of the water. A good illustration of how the soil may be held against the action of the water is shown in Figure 1. In this view, which, however, is not of a morainic slope, it will be noticed that where there are no plants the soil has been carried away, thus leaving the land exposed.

On slopes which are not so steep, plants are much more successful in holding the soil, and in the regions surrounding most of the basins formed by the debris of the terminal moraine, the amount of erosion is not great during an average year. It is obvious then that one important stage in the life history of a pond or lake is that of rapid filling with earth as the result of a correspondingly rapid erosion of the exposed land. This stage ends when large numbers of plants have become well established on the surrounding land, though it must not be supposed that all erosion and consequent filling ends at this time.

Probably while these plants were becoming established on the land, the water plants made their appearance. Usually some of these water plants float in or upon the water, having nothing to hold them to any definite soil region. These form the free swimming water plant societies, some members of which are shown in Figure 2. Others may have their leaves upon, above or beneath the surface, and their roots in the soil, thus giving them relatively permanent positions. This condition is well illustrated by the usual habit of the ordinary white water lily. At the margin of the pond in the shallow water, and in the very wet earth outside the water, are found plants commonly spoken of as swamp or marsh plants. They are frequently represented by the water plantain, the bur-reed, the rushes, and the cat-tails. These plants,

FIG. 2

A pond being obliterated by plants. In the water are water lilies and pond scums. Along the margin of the water the sedges and their crowd are encroaching. Following them are the shrubs and trees.

so far as concerns their roots, must be adapted to the same conditions as those of the plants mentioned in the water lily group, while their stems and leaves have many of the determining conditions found with dry land plants. By a more extended study we should find here some interesting and striking adaptations worked out by these plants which are adapting themselves to two groups of conditions, i. e., those of dry land plants for the leaves and at least parts of the stems, and the conditions of water plants for parts of the stems and the roots. In Figure 2 the fringe about the pond made by the marsh plant society is clearly shown.

Back of this society of fringe plants there usually grows a society made up of a number of such shrubs as the willow and alder brush, while back of these will be found the trees or meadows (Figs. 2 and 3). These groups of plants from the free swimming society to the tree or meadow society may pass from one to the other by

FIG. 3. A part of an old swamp, showing three of the four societies of plants interested in reclaiming it. Below, the sedge and cat-tail society, with which are seen fern plants. Back of this is the shrub society, and following the shrubs are the trees.

insensible gradations. Usually, however, the line of demarkation between the various societies is fairly clear, as will be seen by an examination of the accompanying figures.

A study of the ways in which these various groups affect each other and their environment will afford some interesting problems to those persons favorably located. The free swimming plants, and other water plants out from the water's margin, grow, build up their bodies, and die. Their dead bodies fall to the bottom of the pond, where they decay. Year after year this process goes on, gradually decreasing the depth of the pond, and would eventually, even if unassisted, result in the obliteration of the pond as such. But around the margin the marsh plants are growing, forming thick masses. These build up their soil in at least two ways. The dead plant bodies as they decay add an appreciable amount annually. Furthermore, currents of water running into the pond from adjacent regions are checked by the fringe of marsh plants, and being checked tend to deposit here large quantities of the earth they carry. It is evident that here is a region of rapid soil building, and that this region pushes inward with relative rapidity, year after year diminishing the size of the body of water. The willows and their crowd which follow the marsh society grow and decay, and give way after a time to the trees. Such trees as are best adapted to wet soil, as the cottonwood, are in the forefront of the tree society, just as the best adapted shrubs, notably the willows, are in advance of that group, pushing forward the most tardily adapted marsh plants.

Finally this process has been carried on until the water begins to disappear from the pond, when, for at least some of the plants, a new problem arises. When the total annual encroachment of the society without was slight, it was not difficult for the free swimming plants to move sufficiently to obtain favorable growing places. But when the last of the water region has been occupied by the sedges, rushes, cat-tails, and their kind, the free swimming plants are no longer able to move slight distances and obtain freedom and the water habitat to which they are adapted. When any such great change in the environment of a plant, or any other organism, occurs, and the plant is unable to change the environment, one of three possibilities may be accepted. First, if the plant can migrate to new and favorable environment, it may prosper. Second, if it can readapt its structure to the changing conditions, it may remain, and possibly prosper. Third, failing to do either of these, it must cease to exist. The free swimming plants of the ponds must usually accept the third of these possibilities.

Such is not always so readily true with the water plants having roots. In Figure 4 is shown an old lily pond from which the water has disappeared. The lilies which formerly grew here in the water, as the conditions changed have so adapted their leaves, stems, and roots that they now grow in the so-called dry land with great luxuriance. In August, 1900, hundreds of these plants were seen in full flower with the leaf and flower stalks frequently three and one-half feet in length. Since this lily pond had become dry, it is obvious that these plants have accepted the second of the possibilities open to them.

FIG. 4

An old lily pond. The leaves, stalks, and seed-pods show in the picture. This region was formerly covered with water the entire year. Now that the pond has become dry land, the lilies must learn to live in new conditions or die.

FIG. 5

An old pond almost entirely reclaimed. The incomplete circle of cottonwood trees was once at the margin of the water. The reclaiming of this pond was done almost entirely by natural means, since artificial drainage has been used in this region but a few years.

The last stage in reclaiming these regions by plants is brought about by continued building up of the soil until it is no longer a propitious environment for any of the plant societies mentioned except the last. Such a condition is shown in Figure 5, in which case the incomplete circle of cottonwood trees marks the point of a former margin of the pond. The interior, though somewhat low, has a few of the sedges remaining from the marsh society, but is well occupied by meadow grass, which is a dry land plant. In many places where these swamps formerly existed one may see plants such as the cottonwoods, willows, and swamp grasses remaining, and by their presence telling an interesting story as to what has been the history of their homes.

These plants are relatively plastic, and were able to make the necessary adjustments as the pond became a swamp, and the swamp passed through its various stages until it became a tillable field. In many of our farming regions, where this work of reclaiming was carried on almost entirely by these natural processes, a number of these readapted plants are to be found. The changes in the environment took place sufficiently slowly to make adaptations possible. In many other places artificial drainage and artificial removal of existing plant societies have made the changes in the environment so abrupt that plants could not make the adaptations necessary for growth in these new conditions, and there is little remaining besides the structure and contour of the land to suggest the former conditions.

Principles of Correlation

Francis W. Parker

I. A fundamental error in education is the isolation of subjects on the lines of conventional classification, thus attempting to separate, by teaching, the thought of one particular subject from the thought of other subjects to which it is organically related.

The educative value of one subject is primarily determined by its organic relations to all other subjects. It is therefore impossible to appreciate, or even to understand, any subject without knowing that it is but a part of the whole, and that each part penetrates the whole. Each subject has definite relations to all subjects; thus Physics and Chemistry are the sciences of ever-changing matter, and therefore intrinsic to the study of all other subjects. The distribution of heat, air, moisture, plant and animal life, over the earth's surface, cannot be profitably studied without a knowledge of the earth's surface.

II. **Unity of Subjects:** 1. Man and Nature comprehend all subjects. These two are one in the Creator and the created. The essence of the knowledge of Man and Nature is law; and law has its function in life. Life, then, is the central subject of study.

III. **Examination of Correlated Subjects:** INORGANIC MATTER. Physiography presents the knowledge of the earth's structure and surface.

Geology is the history of the continual changes in the earth's rock envelope or crust. Geology, then, is the history of Physiography: Physiography presents the effects and Geology the causes.

Mineralogy presents the knowledge of the nature and composition of the rock crust or of the material which is constantly undergoing geological and physiographical changes.

Unity: The present surface (Physiography), the changing surface (Geology), the material which changes (Mineralogy).

Meteorology teaches the action of heat, moisture, and air upon and in the earth's crust; and their distribution over the earth's surface. Heat, moisture, air, are the causes of changes in the rock crust (Geology), in the surface of the earth (Physiography), and in the composition of rock material (Mineralogy).

Unity: Causes of changes in the earth's crust (Meteorology), the changes (Geology), the intrinsic effects of changes (Mineralogy), the surface effects of changes (Physiography).

Three Earth Envelopes: 1. Rock, solid and pulverized. 2. Water. 3. Atmosphere.

These three envelopes, which interpenetrate each other, are constantly changing under laws. Physics and Chemistry present the causes, and therefore the laws, of all changes in inorganic matter. It follows that intrinsic knowledge of all inorganic matter depends upon a knowledge of Physics and Chemistry.

Unity: Changes in the earth's crust (Geology), in the nature and composition of rock (Mineralogy), in the resultant changes in surface (Physiography), in causes of changes (Meteorology); which in turn depend absolutely upon the laws of Physics and Chemistry. For instance, the movements of the earth's crust may be comprised under (1) volcanic action (Physics and Chemistry), (2) folding and faulting (Physics), (3) erosion (Physics), (4) building with eroded material by running water and winds (Physics). For instance: Changes in composition of rock by heat and moisture (Physics and Chemistry); changes in kinds of rock (Physics and Chemistry); changes in the earth's surface (Chemistry and Physics); in moisture and air (Physics).

IV. Correlation may be illustrated by distribution.

One outcome of the study of physiography is a knowledge of the distribution and relation of the surface forms of the earth — mountain ranges, river basins, plains, plateaus, etc. A knowledge of this distribution involves a knowledge of the architecture of continental and island structure (Geology), and the material out of which they are constructed (Mineralogy).

1. A working knowledge of Physiography makes a knowledge of the distribution of heat (Mathematical Geography) possible.

2. A knowledge of surface forms and the distribution of heat is the basis of a knowledge of air distribution.

3. Heat and air distribution explains moisture distribution.

4. Upon a knowledge of surface forms and soils (Mineralogy), and the distribution of heat and moisture (Meteorology), depends the knowledge of the distribution of plants.

5. Upon all the foregoing facts (1, 2, 3, 4) depends the distribution of animal life, including man.

NOTE.—Elementary study has for its purpose a preparation for the study of distribution. This probably may be accomplished in the Eighth or Ninth Grade. Correlation is absolutely essential to profitable elementary study.

V. **The Function of Inorganic Matter is Life:** 1. Plant Life. Plants depend upon (a) a surface environment (Physiography); (b) soil (Mineralogy); (c) heat (Physics); (d) air (Meteorology); (e) drainage—movement of water in the soil and on the surface (Physics and Chemistry); (f) fertilizing—changes in soil (Chemistry).

NOTE.—A knowledge of any plant comprehends its physiographical, vegetable and animal environment, climate, soil, the nourishment of the plant by moisture, the function of its water table (Geology), capillary attraction (Physics), evaporation and transpiration.

2. Animal Life. A knowledge of animal life comprehends a knowledge of inorganic plant matter under all its classifications, and a knowledge of plant life and its relation to other animals, including man.

3. Man's Life. Nature furnishes man with food, clothing, shelter, luxuries, means of communication and transportation, etc.

The key to man's evolution is his physical environment (surface forms, climate, soil, animal life), and his relations to the rest of mankind. Life on the plains, in woods and mountains, the surrounding plants and animals, enter into and become strong factors in individual and community life. All the sciences of man have the closest relations to nature — archæology, philology, anthropology, and ethnology. The philosophy of history can be understood only by the closest study of man's environment. Literature is the study of man and nature. Arts and crafts are the expressions of man under the influences of nature and society.

VI. **The Principles of Study:** 1. How to study is a question of immense, if not the greatest, importance in education. Man and nature are the sources of knowledge. They

comprehend, therefore, the subjects of all study.

2. Attention to educative subjects is study. Attention is the holding in mind of images for their growth.

3. A strong image is (a) a close correspondence to an external object, (b) a unit consisting of strong related images.

4. Analysis, judgment, inference, and reason have images for their intrinsic basis. A philosophical memory is possible only under the potency of strong images. The function of language is to hold and unite images, and the results of image growth.

5. There are three modes of attention defined by external stimuli: Observation, hearing-language, and reading.

6. Observation is imaging under the stimulus of an external object acting upon consciousness; the purpose of observation should be the formation of a strong image corresponding to the object observed.

7. Hearing-language and reading have both the same function, to wit: the union of images that have been previously in consciousness.

These processes become study when the images are held in consciousness for growth.

The laws for the concentration and expansion of images are complied with when correlated images come freely into consciousness, unobstructed by the limits of one class of objects or subjects. Following a single classification means the exclusion of images that should make the central image strong. For instance, the images of history, excluding physiography, meteorology, botany, etc., are in a marked degree weak or attenuated. Physics and chemistry, without the images of the materials changed under the action of physical and chemical forces, induce an obscurity of image.

Conclusion: From the standpoint of external objects and from that of psychology, the isolated teaching of subjects is absolutely unpedagogical.

Discipline and skill in all the modes of attention are best acquired through the energy of growing, correlated images.

All educative acts of attention should be the imaging of Man and Nature; that is, all study should be concentrated upon these subjects. Thoroughness in knowledge consists of strong, correlated images. The processes of attention should be acquired under the energy of imaging.

Expression in all its modes — gesture, speech, music, making, modeling, painting, drawing, writing — has three influences upon human growth: (a) Physical development in making the body, including its agents, effectively responsive to the will; (b) mental development in the reaction of motor discharge upon consciousness; (c) strengthening and disciplining moral growth under a high ideal.

The best physical growth is the best mental and moral development. Each mode of expression has its special reactive and educative function, for which no one or all of the other modes can be substituted.

Elementary skill in all the modes of expression may be best and most economically acquired through the manifestation of educative thought. The eight years of the elementary school may be spent in the direct study of Man and Nature, which means that both attention and expression should be concentrated upon the study of nutritive subjects.

Under the purpose of acquiring certain definite quantities of knowledge the attempt to teach in the most elementary way all the subjects classified under Man and Nature, together with the development of power and skill in all the modes of attention and expression, would be fatal in the extreme: it would be attempting the impossible. Under the ideal of knowledge-getting there is no guide to the selection and adaptation of knowledge.

VII. **The End and Aim of Education:** 1. An ideal determines everything that goes into its realization: knowledge, reason, discipline, interest, and method.

NOTE.—The ideal meant is the personal one held by the pupil.

2. The greater the ideal the more useful it is to humanity; the more knowledge, reason, discipline, interest, it demands for realization.

3. The needs of society determine the work of the school. Put that into the school which society should have for its improvement.

4. The predominant need of society is character expressed in terms of citizenship.

5. The end and aim of citizenship is ideal community life.

6. The school should be an organization of ideal community life, in which every pupil is a citizen, or is becoming one.

7. The teacher is the organizer of the best society, and the creator of a healthy, normal, moral public opinion.

8. The nature and capacity of the pupil determine his personal relationship to the community (school) of which he is a member. Citizenship develops the best, all the best, and only the best in the child.

9. Knowledge is absolutely essential to the development of the citizen and the progress of the community.

10. The highest and most persistent incentive to learning, under the direction of an efficient organizer of society, is the desire to help others.

11. Every ideal determines the knowledge needed to realize it. The knowledge necessary to realize community life is the broadest, deepest, most comprehensive.

12. In all the practical work of life, correlation is always the common sense rule. Uncorrelated knowledge is not usable.

VIII. **Course of Study:** 1. The needs of a growing community life (school grades) is the only proper guide to the selection of subjects of knowledge and skill for the course of study.

2. The spirit of helpfulness is the only righteous incentive to all school work.

3. Ideal community life is always growing in reality and growing in outlook; therefore a true course of study is constantly changing in its adaptation to changing needs and growing ideal.

4. Under this ideal, expression in all its modes is using knowledge for the good of others. Study is preparation for use. Moral power is acquired by using knowledge for the best good of the community.

IX. **Concentration:** 1. Under the ideal of citizenship and community life, concentration may be defined as bringing to bear the whole being—personality, originality, research, reason—upon the realization of complete living in the school.

2. Concentration may be enhanced a thousand-fold by unity of purpose on the part of an entire faculty.

3. The study of the needs of community life is infinite in its possibilities. Under self-government, the ideal of society is growth. Anything fixed in method or system is impossible.

4. This ideal demands the closest study of the nature and possibilities of the child.

5. Each child becomes a member of society, a factor in civilization; he is led slowly and steadily to feel and understand his responsibilities as a citizen.

6. Concentration demands correlation. The question of questions is, what is the best knowledge to community life?—thus breaking down the unpedagogical barriers of classification.

7. Concentration is the economy of physical, mental, and moral action. The reason why students in general know so little is that knowledge, and not character, is made the end of education.

Notes on Psychology

NETTIE A. SAWYER

(Fall Quarter)

Statement: "I see" means I am conscious of an image.

Experiment: I experiment with books, hats, pencils, lamps, etc. Only when I am conscious of an image do I see a thing.

Question: Is there a state of consciousness without an image?

Experiment: I recall to memory a face, a saying, an act, a landscape—in every case I have an image—in the case of the saying, there may be more or less images according to circumstances. When I recall some quotation from a poem I simply image the contents of the extract, as in "The day is cold, and dark, and dreary."

When I reason I have images.

Example: I say: "All quadrupeds are four-footed. This animal has four feet, therefore it is a quadruped." Here I have vivid images in both parts. I experiment again with reasoning. I say: "This man has died; that man died. All men I have known have been under a certain age; therefore all men must die." I have images, though different from the above.

Again, I will to do a thing. I decide to talk. I have an image of the sounds of the words, and of the things I am going to talk about. I decide to walk. Here I have an image of the feeling of the ground I tread upon—or an image of the place through which or to which I am going.

I have a strong emotion; am angry with some one; am pleased because of some event; am pained at some sight, sound, etc.

Inference: From the above I infer that there is no state of consciousness without an image; but the nearest to the absence of an image is that state described as "the blues, with nothing to be blue over," or as "happy without a cause." In every case, however, I have found that these emotions are connected with images in unconscious consciousness.

Question: Is a written word an object? Yes; it has length, bread, and thickness.

Statement: External causes of images are objects. Therefore a word is an object.

Statement: The external causes that create images are: First, words; second, the things for which words stand.

Question: Do all words call up images?

Experiment: I see written "pencil" and "bleistift." To some the second did not call up images. To me it did, but the French for pencil does not call up an image. By many experiments I infer that words call up images only as we are trained to connect them with that for which they stand.

Question: What kinds of external objects create images in our minds?

Experiment: I find two general kinds—those that make us conscious directly of an image and those that bring to our minds the thing indirectly; that is, symbols and the real things.

Question: What is attention?

Statement: It is the holding of an image under the stimulus of external objects. By repeated experiments I have verified this.

Question: How many modes of attention?

Experiment: I see a boy. Observation here is attention. I hear a bell. Observation here is attention. I smell a flower. Observation here is attention. I touch a ball. Again observation is attention. In each case the object acts directly.

But if I see "boy," I read and do not observe. The same with "bell," etc. Nevertheless I attend. I hold an image under the stimulus of the object which is here a word (written). So reading is a mode of attention.

Again, some one says "bell" to me. I have an image under the stimulus of the spoken word, and this is an external object. The waves of ether are material things. The spoken word is a mode of attention.

Doubt: I have been wanting to use the picture as one of the modes of attention. I have nearly concluded (though not positively) that the picture does not deserve a place here.

I have experimented with pictures of landscapes. I believe they affect me as objects, that is, I enjoy the immediate scene I am looking at, and not the one the picture represents. I have experimented with pictures of animals with the same results. If I see a cat run after a mouse in a picture, it is the picture cat and mouse, and not some imaginary animals, which hold my attention.

Question: What is the function of a word?

Experiment: I said "that." It brought no image. I said "red." It brought a faint image. I said "rose." It brought a clearer image. I said "red rose." It brought a clearer image. I said "that red rose." It brought the clearest image so far. I said "that rose is red." It brought the clearest image of all.

At present I infer that the function of a word is not brought out in the isolated word always, but in combination with others. I would say that the function of a word is to create an image, or to combine with other words in doing so. The sentence is the unit, and not the word.

Question: What is the function of language?

Experiment: I listen to English. I understand. I listen to French. I do not understand, because certain sounds do not stand to me for anything—not for the images that are in the mind of the speaker. The function of language must then be to create similar images for those talking and hearing.

Explanation: Colonel Parker uses "attention" in a restricted sense to mean the holding of images under stimulus of external objects. Some authorities give it a wider sense.

Statement: Reading is imaging, and nothing else.

Doubt: I do not yet see this.

Experiment: I find that visual images are in all sentences where I find any images. I find many sentences where there are auditory images—images of smell, taste, and touch. The following has all I believe: "Although this orange has a crinkled skin it smells fresh, and I think will taste sweet."

So far, so good; but in the following sentence

I get no image: "The idea is the content of assertion, and without it assertion is nothing." (From *Hobhouse*, p. 88.)

Question: What is the difference between cursory reading and study?

Experiment: I read the Norse myth about Balder, at first quickly; my aim was to produce the new images as quickly as possible in order to get to the end; to see how the story was coming out. The result was, I did not get the connection of images; that is, I did not hold the first image and let it grow under the influence of the new ones. In studying it I did this, and got one big image in place of a lot of detached ones. I had it in memory by study, not before.

Doubt cleared away: It occurred to me that the reason I had no image in reading the sentence from Hobhouse was because I did not understand it. I began to get an explanation ready and images came immediately. I took the assertions: "The day is dark." "The snow is white." Here the ideas of darkness and whiteness are attached to some very definite thing, and are not intelligible till they are thus attached.

I am quite convinced that all reading for me is at the foundation imaging, and nothing else.

Former statement corrected: I said, "Visual images are in all sentences where I find any images." I do not think this is true. For example, in "The cry was loud," or better, "The noise was loud," I get an image of loudness and noise without seeing anything; it is purely auditory, I believe, and not attached to any visible thing.

Question: What is the fourth kind of attention? Pictures?

Statement: A picture may have the attributes, and many of them, of the thing it represents. It seems to have a double function: to stand for that thing, that is, symbolize it, and to give intrinsic interest on its own account, as suggested above. There seems to be a law that as one increases the other decreases.

Example: As a picture of a bear changes from a colored and fully worked out bear to a mere outline in black on white paper, the intrinsic interest decreases and symbolic interest increases.

We finally come to the map where there is no intrinsic interest, and all is symbolic. I believe the map is the fourth mode of attention, strictly speaking, that is, graphic symbolism by means of lines, and not words, and that the picture is really a combination of the first and fourth modes.

Question: How do images grow? Follow one in its growth.

Growth of an image: Wild canary. When I was a small child I saw some tiny birds in our currant bushes in a nest. They were naked, had large mouths and eyes. Some one said they were wild canaries. When I went to see them next time they were gone. I associated their going with the word "wild," and thought I had frightened them away. So my first image of a wild canary was a small, naked, flesh-colored, shy bird that built in currant bushes.

Some time later I heard it said that the wild canary and the yellow-bird were the same. My image then changed, the flesh-colored birds changed to yellow ones.

I next saw a yellow summer bird, and my image changed as to size. I got near it and saw some black on head, wings, and tail, and the color image was still more modified.

Only two years ago I heard it and also saw it sing for the first time. My image grew more.

I found in "*Bird Craft*," p. 140, by M. O. Wright, a description and picture. My image was stronger and more exact.

My present image of this particular bird is of a bird larger than a wren and smaller than an English sparrow; a bird which is yellow, with whole top of head black, and wings and tail black, but marked with white; of a shy bird that nests usually in maple trees rather than in currant bushes, and lives about the garden, singing sweetly. My image has grown by observation, by reading, by spoken words, and by pictures.

Question: What is attention?

It is study. It is holding an image and letting it grow.

Statement: You can have no new images. (This applies to adults only.)

Experiment: I see a red apple. I find in examining that my image contains elementary ideas of color and form. By experience I have associated a roundness of form with the apple. This present image is caused by this apple directly, and indirectly by other apples and round forms of past experience. Without the past the present would have absolutely no meaning.

Question: How do images grow?

Experiment: I recall the growth of bird image, before given. At first my image of the color was that of flesh-color. Some one

said the canary was yellow. This word "yellow" creates an image in my mind. When I heard this said, I discarded the flesh-color, and connected the image of yellow with the image of form which belonged to my first image, and I had a new image. My image had grown by expansion. This is a synthesis of images.

Experiment: I see a certain design for the first time just now. At first I had only a general image—I mean the details were not worked out. I saw that it was a conventional design, made of leaves and flowers; that was about all. By holding this general image the details come. I see that the leaves are larger than the flowers; that the leaves are long and slender; that they curve upward in a graceful way. I see that the flower is round, and of a lighter color than the leaves. In other words, my first image has worked itself out clear. I have analyzed my first image by concentration.

I infer, therefore, that images grow by synthesis and by analysis; or, in other words, by concentration and expansion.

Question: What is the difference between a vague image and strong image?

Experiment: I think of the cardinal grosbeak. I know about how long it is, what color it is, what shape its head is, etc.; yet I have never seen one, but have only read about it. My image is not definite, I know, because I think every new red bird I see if of this length may be a cardinal grosbeak. My image is vague.

Two years ago I saw the scarlet tanager for the first time. I had walked five miles hoping to see it; so when it appeared in the woods I observed it most carefully, noting its exact shade, its length, the arch of its neck, the amount of black on wings and tail, its song, its flight, etc. I have a very vivid image of it, for I looked at it again and again, following it as far as I could. This is a strong image.

When I compare my images of the cardinal grosbeak and the scarlet tanager they are utterly unlike. The strong one corresponds in detail with the real bird. The other does not.

Statement: A strong image has many elementary ideas corresponding to the attributes of the thing imaged.

Question: What is the relation of expansion to concentration? Can one be without the other?

Experiment: In the design mentioned before, when I noticed the shape of leaves, flowers, etc., I must at the same time unite these separate images, otherwise it would not be a design in my mind, but only a lot of isolated images. This process is called concentration, merely because this seems to be the more permanent process, for I really have a unit in mind even when I look at its different parts.

In the case of expansion given above, there was concentration. Example: When I change the flesh-color for the yellow color, I first concentrate my mind on the color of my first bird, leaving out of consideration its size, form, etc. I must do this before I can replace the flesh-color by yellow. Again, as before, the name is given merely to designate the prevailing process involved.

I infer there is no concentration without expansion, and *vice versa*.

Question: Upon what does the value of reading depend?

Statement: Upon the clearness of images it brings from our past experiences.

Question: What is the difference between an object and a picture?

Answer: What is the difference between a real bear and a picture? And the mere outline?

The real bear has all the attributes of itself. The outline has a very few attributes; the picture more than the outline and less than the bear.

Statement: Pictures are universal language, because the elementary ideas are in the minds of all people; that is, they call up images to all.

Sculpture has more attributes than pictures. Colored picture has more than black and white.

Statement: Holding of images has an important place in all growth.

Question: What is the great natural means of holding images?

Colonel Parker explained it as motor-discharge.

For example, if I see an apple, a sight sensation passes along the nerves to the sensory center. This current disturbs the equilibrium of the nervous matter. There is an excitement, a disturbance which must be quieted. The only way it can be done is to let the outgoing nerves carry it off. There is a mysterious connection between the brain-cells and the mind. At any rate, the excitement of certain brain-cells is accompanied by certain mental images. Each time a brain-center disposes of this dis-

turbance in a certain way, the more apt it is to do the same again, and thus bring again the corresponding mental image. It is only by means of this constant disturbing and quieting of the brain-cells that they grow, and thus that the corresponding images develop.

Question: Can you do anything without first imaging it?

Answer: I think not. That is, you must have imaged it once. It may be automatic now.

Question: How are images held?

Answer: By expression only. This is simply analogous with the motor-discharge.

Statement: The fundamental modes of expression are—

1. Gesture.
2. Voice without speech. (Expresses emotion.)
3. Speech.
4. Music.
5. Manual training.
6. Modeling.
7. Coloring.
8. Writing.

Statement: All expression has for its function the holding of images; that is, the intellectual side.

Statement: A strong image tends to find expression in self-activity.

Statement: The distinction between strong and vivid images is, that the vivid are colored by emotion.

Question: What mode of expression develops consciousness most? I shall have to think more before I answer this.

Question: Has each mode of expression a physical reaction? Does each mode of expression react on consciousness?

Answer: Yes. For example, in modeling an ear of corn from nature, I first get the image, then use my hands to objectify it. While doing so my hands get the power to respond more readily another time. Then conversely the work with the hands helps me to get more perfect images.

Question: What does exercise of all the modes of expression give?

Answer: A fully rounded development.

Question: What is the moral function of modes of expression?

Answer: I should say to create genuine feeling and avoid sentimentalism; that is, to connect proper action with feeling and thought.

Question: To what do we give attention?

Subjects of attention: 1. Geography, earth's present surface.

2. Geology, causes of present surface.
3. Mineralogy, composition of surface.
4. Meteorology.
5. Physics.
6. Chemistry.
7. History.
    a. Anthropology.
    b. Physiology.
    c. Psychology.
    d. Sociology.
    e. Archæology.
    f. Philology.
8. Biology.
    a. Plant-life.
    b. Animal-life.

All these subjects of attention are related.

Mathematical Geography

Zonia Baber

True geographic concepts are not composed entirely of plains, mountains, oceans, and other attributes of the earth's surface; the sun in its differing relations to the earth plays a most important part in the formation of such concepts. The difference in the winter and summer aspects of temperate North America, for example, would be appreciated with difficulty by an untraveled inhabitant of lowland equatorial tropics, inured to the monotony which results from a uniform twelve-hour day. Although twice in the year he would cast no shadow at noon, and during one-half of the year his shadow would fall to the north, while during the other half it would fall to the south, still the change would not be sufficiently marked to break the dull uniformity of daily and yearly existence. A cold, dark day in which the sun did not appear above the horizon, even at noon, would seem no less wonderful to him than a day in which the sun made his entire circuit throughout the twenty-four hours without dropping below the horizon even at midnight.

In our latitude the constantly changing picture stimulates interest in causation. Even the young children are curious to know where the sun goes when it drops below the horizon. The little five-year-old child who asked how the year could go on making days showed an early and intelligent interest in astronomical geography.

All primitive people, or those who try to account for natural phenomena by mythical rather than by scientific methods, have shown a deep appreciation of the phenomena of sunrise, sunset, spring and autumn equinoxes, winter and summer solstices, as shown in their festivals and folk-lore.

It would not seem strange if a people living in a tropical climate were less rich in myths setting forth the relation of the sun and earth than a more northern folk, to whom the coming of the sun meant perhaps the relief from a long, cold famine.

It is not strange that a people geographically circumstanced as are the northern Norwegians should wait with restless eagerness and receive with great rejoicing the first appearance above the southern horizon of the ruddy face of the sun.

When a pupil can in imagination place himself in any latitude, on any day of the year, and describe the sun's apparent path in the heavens, he has a key to much geographic knowledge.

The lack of accuracy in observation of the sun's path in the heavens in his own locality is the great obstacle in the way of the pupil's imaging its apparent movements in other latitudes.

Even the primary pupils are interested in making and recording accurate observations of the sun, if there seems to be a necessity for such knowledge, as is shown in the correspondence of the grades with foreign children.

(See geography outline, December COURSE OF STUDY.)

The record of the length of the noon shadow of a certain object, made at regular intervals, will not only impress one with the fact that the shadow lengthens and shortens, but with the peculiarities of the movement.

The exact time at which the sun crosses

the observer's meridian can be obtained by recording the length of the shadow every few minutes before and after noon;

Fifth Grade finding noon shadow and obtaining declination of sun.

the shortest shadow will be the noon shadow, and will fall on a north and south line.

This record, together with that of the length of the day, position of the sun on the horizon at rising and setting, kept for one year, would afford an excellent basis for pupils mature enough to use it for imaging the implied relations of the sun and earth. If he has established the causes of the phenomena in his own locality, he has discovered the same for the entire earth.

(See January COURSE OF STUDY, page 429—Mr. Myers's Outline on Astronomy.)

Pedagogic School

Continue unfinished work outlined in January COURSE OF STUDY.

Past geographies of North America.

How are the past aspects of a continent obtained?

What are the evidences that North America has had different coast-lines?

What are the evidences that the continent has passed through many changes of climate?

What proofs are there that the topography has changed?

Visit Field Columbian Museum. Study geologic exhibits.

What distinguishes the geologic epochs?

Can you trace any evolution of life in the paleontological exhibit at the museum?

Considering the maps of the past geographies of North America as the maps of the archæan, silurian, carboniferous, cretaceous areas, etc., what inference in regard to the development of the continent seems just?

Would you predict a larger or smaller future North America?

On Thursday morning, February 28th, Prof. R. D. Salisbury, of the University of Chicago, will lecture to the pedagogic school on "The Evolution of North America."

References: Dana, *Manual of Geology;* Geikie, *Text-Book of Geology;* Scott, *Introduction to Geology;* Tarr, *Elementary Geology;* Shaler, *Story of Our Continent.*

Pedagogic questions: Is the knowledge of the geology of a region of value in the study of its present geography?

At what age are children interested in the causal aspect of things?

In teaching the continent of North America to fifth-grade pupils, for instance, what part of its geology, if any, would you present?

How would you introduce it?

Art

John Duncan

We shall make a call for art expression (drawing and modeling) in connection with the work done in Literature in the Grades and Pedagogic School. (See outline of Dramatic Art, by Miss Fleming.)

In the Fifth Grade, Washington Irving's story of Rip Van Winkle was read the other day, and then the children were turned loose upon the blackboard. In a few minutes we had a dozen drawings representing the various incidents of the story—Rip condoling with his dog "Wolf"; the first meeting with the dwarf; the solemn bowling party; Rip asleep; his awakening; and his entrance into the village. The teacher of drawing then made a larger and more elaborate picture in color before the children, incorporating their suggestions as they eagerly watched its development. We found when we started to draw that a good many points of the story had escaped us, and that it was necessary to make a closer study of the text. We turned again and again to the book, to see just what this man's face was like, and how that other one was dressed. In this way the drawing was done to dictation, and we did not rest satisfied till we arrived at a close correspondence in every detail between the picture and the narrative.

The students of the Pedagogic School are discussing child literature; what are the best stories to tell children, and why. Together, too, with their work in History—the study of elementary occupations—they are giving some attention to the earliest beliefs of man incorporated in the myths of primitive folk. These child stories and

early myths are found to converge, and the nursery tales of the type of *Jack and the Beanstalk*, and *Goldenlocks*, and *Cinderella* are seen to be survivals from that dim prehistoric past handed down from generation to generation.

From these first favorites we may rise to broader and more beautiful conceptions, containing a greater volume of truth and nobler ideals of conduct. In the mythology of Greece a higher level is attained, and in the legends of the saints we reach still higher, till we arrive at the best ideals of our own day and stretch forward to those

ATHENA AND EROS—DUTY AND INCLINATION

of the morrow. In the Pedagogic School we shall illustrate this literature with drawings on the blackboard. Some ability to make original illustrative pictures is a valuable acquisition to the teacher. Even a little skill is immeasurably better than none. The audience that the teacher will have by and by is imaginative enough to overlook many shortcomings in the drawing, reading through the crudest and slightest sketches the intention of the draughtswoman.

The teacher is her own severest critic. Our principal difficulty has been to get the members of the Pedagogic School to look with any degree of toleration upon their own performances. They erase their drawings immediately, lest any one should see them. They are not content to draw like little children, and many are unable to do any better than little children. This discovery of their incompetence is a great humiliation to them, a severe blow to their *amour propre*. Only the most courageous and modest accept themselves without remonstrance.

And yet we have had some encouragement to believe that the desired power is lying latent in most of the students, needing but exercise to bring it into freedom and happiness. Many have not drawn since they were children, and naturally feel helpless enough now; but if they will only persevere the habit can be formed again and become a second nature.

We are not willing to postpone the attempt to do creative work till such time as the students have gained sharply defined mental images and a developed technical skill, but believe that if the demand for expres-

sion is made the students will necessarily, consciously and unconsciously, set about the acquisition of these images, and will gain the required skill in the actual working out of their own conceptions.

But, one may object, how can the student draw if she has no definite mental images? Is there not here a place for the life-class? Had she not better begin by drawing from the model, and she will by and by be better able to launch out into original work?

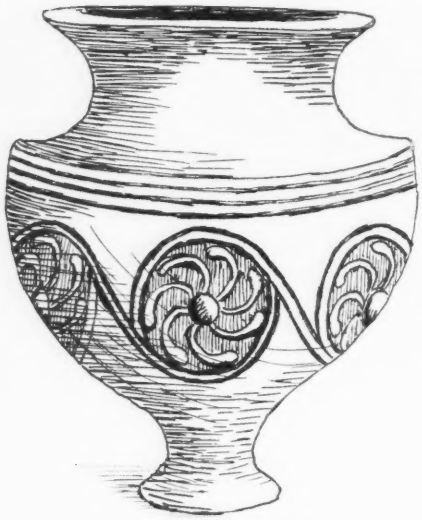
It is too slow and round-about a process. We want a living, moving, expressive art, and the ordinary student who has passed through the life-class is no nearer the wished-for end than the veriest beginner. Let the student instead express the vague and crude images she has, and she will feel the need for more accurate ones.

Opportunities for clearing up her artistic ideas are to be found everywhere. In school itself, is she not surrounded with speaking, dramatic figures, from the happy little dancers of the kindergarten to her fellow-students in the Training Class? In the street, in the car, in the park, and at home are inestimable chances for studying humankind. How infinitely better are these animated models, than the dull, self-conscious models of the life-class! If the life-class has a place it is not just here. It will be of service when a closer, more analytical study of form is called for than is necessary or desirable at the stage in which most of our students find themselves.

Let us carry sketch-books and consider the world about us as a great life-class, where we can learn all, and immeasurably more than all that we can find time or opportunity to express.

Constructive Work in History

Emily J. Rice



MYCENÆAN DECORATIONS

In presenting the material of history, the connection between the past and the present should always be made clear, in order that the child may interpret his own experience through the accumulated experience of the race. Unless this connection is made, the child finds nothing in the subject-matter of the history lessons which helps him to solve the problems of his every-day life or furnishes any motive for work. He is constantly reaching out for the means of answering questions in regard to his social environment. To be of value to him, historic material must be put before him in such a way that he will see its relation to his own thought and action.

It is also necessary that the child should express his knowledge in order that it may strengthen his power to think and to act. The past will be full of meaning to him in proportion as he expresses it in terms of his own life. We must learn to use not only dramatic representation, but also clay-modeling and painting, drawing and designing, making and building.

As far as possible, all hand-work should have social value, a use that children can see. They should feel that they are making things because they need them, and not as illustrations of what others have done. The children are thus actual partakers in the work of the world. Interest in the processes of manufacture may lead them to construct objects as they were made in the past, but even here they should be inventors rather than imitators.

The study of industries may be made a series of problems, the teacher presenting conditions and children drawing their own conclusions. If the children are able to use books, these may supplement the work at every step.

The accompanying illustrations show

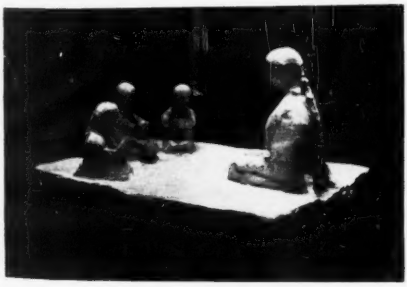
MYCENÆAN DECORATIONS

some of the work of our own school in clay-modeling. The reproductions of vases illustrate pottery designed by members of the pedagogic class, and represent a part of last month's work. The representations of casts illustrate the work in clay of the Fifth Grade children who have been studying Colonial history, and of the Sixth Grade children who have been studying China.

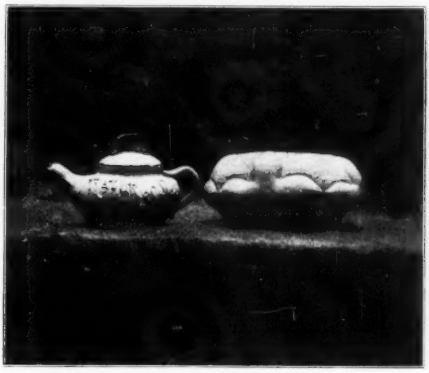
The first year High School students will make pottery during the month of February. The decorations in relief will be adaptations of the conventional patterns found on the pottery of the Mycenæan period. It will be observed that these students have just finished the study of the Mycenæan Age.

Possible Outline for the Study of Pottery: (This is given as an illustration of what may be done in any one of the arts. The study will occur over and over again in connection with the different historic people discussed.)

The children are familiar with the art in the dishes used at home, and with the material in their modeling. Let them suggest things that are made of clay. Show them different kinds of china, tiles, vases. Lead them to conjecture the cause of the invention of pottery. Let them mold dishes and decorate them with patterns of their own invention. Drying in the sun and baking in an oven will be useful experiments. Let the children note carefully results of each process. Compare their work with Indian pottery; it will be very much like that of primitive people. Compare with modern pottery. They will see the difference in shape and smoothness of surface.



A CHINESE SCHOOL



WORK OF PEDAGOGIC CLASS

Study the potter's wheel. Show its development from one horizontal wheel, hand-turned, to two horizontal wheels, lower one turned by foot. Let the children make a simple one. Let them use this for making better vases than they could make without it.

Stories of Luca della Robbia and Palissy will illustrate the discovery of the art of glazing. *The Porcelain Stove* (Wiggins) is a useful story, as is also *Robinson Crusoe*. The origin of pottery is well shown in Robinson's need of dishes in which to keep grain dry and to cook, and the processes of making and learning to bake the pottery are well illustrated in this story. Let the children do the work that Robinson did, and get, as far as possible, the benefit of his experiences.

Greek Pottery: If the story of the Odyssey or any part of Greek life is used, Greek pottery may be introduced as a study to continue the development of the art.

PRISCILLA

Here beauty of form may be shown by pictures or vases themselves, and the decorations made a means of showing the life and thought of the people. The children should mold Greek forms, and decorate their vases with Greek patterns. (The Art Institute has good illustrations.)

Aztec Pottery: In connection with Colonial history, we come in contact with the higher forms of Indian life in this country. Here we may show the development of the art of pottery again, and trace the difference between the best Indian pottery and Greek vases, and show modern vases. The Field Museum will furnish good illustrations. The children should copy the specimens seen there.

The Middle Ages and Modern Art: Here we come again to the development of the art of glazing. The stories of Luca della Robbia and of Palissy, of the beginnings of Dresden, Delft, and Wedgwood, and of the Portland vase may be found useful. Longfellow's poem, *Keramos*, may be adapted as a story to be told with many illustrations in pictures and objects. Older children may read this poem profitably.

References: Binns, *The Story of the Potter;* Luca della Robbia, *Pottery*, (Britannica); Lamartine, *Celebrated Characters* (Palissy); *Stories of Industry*, vol. 2; Nelson, *The Story of Palissy the Potter* in *Records of Noble Lives;* Chapman and Hall, *The Industrial Arts;* Mason, *Origins of Inventions;* Ratzel, *History of Mankind.*

Excursions: To china shops; ceramic rooms, and art galleries.

Speech, Oral Reading, and Dramatic Art

Martha Fleming

Pedagogic Class: The problem to be worked out in this class, which is so large that each individual receives less than an hour of time during the quarter, is how to make each one feel responsible for the work and take an active part to such an extent that he will gain some skill in expression. This could not be done by lectures or by any study of literature that stopped short of actual oral expression. In the hope of meeting the need for more opportunity, the play of *Hamlet* was selected. The class would have tired of any literature except the greatest before the point of expression could be reached.

The class read the play until each one was able to present the argument in a paper which could be read in five minutes or less. Each scene was then given out to a group corresponding in number to the number of characters in the scene. Another student was made stage manager of the group. Each group presents the scene, committing the lines, and giving the action that in their judgment it demands. The rest of the class watches the work closely, and at the close

of the presentation the whole scene is discussed — the good things noted, suggestions made, and criticisms offered. In this way we have worked through three acts. The result has been a careful, independent study of the text, and an effort at interpretation which has been marked with much true feeling. The interest in the whole class has been intense.

Shakespeare was an actor; he knew the stage; the play was written to be acted. The simple reading of it cannot give its full beauty and meaning. The eye as well as the ear must be satisfied.

This work will be continued through February, and if possible a closer study made of some of the scenes. A character study of Hamlet will be written by each member of the class.

In connection with the History and Art departments, the story of *The Sleeping Beauty* will be told to the class. Tennyson's poem, *The Sleeping Beauty*, will be read orally. Each of the class will write the story as it appeals to him individually. Some practice in story-telling will follow. Other fairy stories will be treated in the same way, and the little poem, *Up the Airy Mountain*, read orally by the class. It is hoped that something original in both literature and art will be the result of this part of the month's work.

French

Lorley Ada Ashléman

There can be no one set method for the study of a language. The soul of the method is the image-growth. Image-growth is never the growth of one image to the exclusion of another, nor do any two images grow in exactly the same manner.

To know a language is not simply to be acquainted with elements of grammar (for grammar must be learnt by the language, and not the language by the grammar), and to have read with more or less trouble and difficulty one or two texts from the many treasures which the French literature possesses, but it is to have an acquaintance with the genius of the language, the genius of the people—to feel a word instead of translating a word.

Why should the thought of a language come through the intermediary of your own language? Many only read English into which more or less laboriously they change the French words. It is needless to dwell on the fact that such readers get the entire thought from a translation, usually a very bad one, and never can they have any exact perception of literary excellence in French, nor distinguish shades of meaning different from those to which they have been accustomed in English.

Is it possible to have genius and feeling at the beginning of the study of a language? Can it be made anything but a fine gymnastic memory exercise?

Gouin's method has made a great step in advance, when compared to the learning of a language by the translating and memorizing of sentences found in methods that preceded his; as, for example, "The trees of the good baker's wife. Have you a hat? No, I have a broom." But, unfortunately, the Gouin method is more or less artificial. The language study is isolated. The lessons, though apparently forming a connected whole, are only a cunningly arranged vocabulary. The vital part is missing—true correlation with other educative interests.

A knowledge of the every-day speech

of a people is necessary for the intelligent appreciation of its literature. The success of acquiring the every-day speech will come only when each and every teacher (and those in charge of materials and hand-work are especially needed at the beginning of the study) helps the language teacher by himself teaching in the foreign language.

Cooking, sewing, manual training; the formation of mountains, rivers, and plains; the modeling and study of flowers, trees, and animals permit the child to grasp sentences as a whole with very little intermediate English. In the study of these different subjects has the student not already unconsciously assimilated the principles underlying the literature of the language?

You ask, if a child in sewing uses the French vocabulary instead of English, has he any greater mental development, a clearer image-growth?

As yet I cannot truthfully answer yes, but I truthfully feel yes.

There certainly must be growth in the assimilation of new idiomatic forms which carry about them an indefinable atmosphere of another people. Would not the inevitable comparison of two idiomatic language forms enhance the comprehension of a child's own language?

Supposing we admit that for the moment the image-growth is no greater. In sewing, the children are making a work-bag to hold their sewing materials. They themselves thought of it, but the thought was inspired by the teacher. The bag is not finished the day it is begun, neither is the work in sloyd, nor in clay-modeling. Very few children will yearn for a mathematical image-growth if some inspiration has not given rise to the feeling of the need. Why should language-study be treated differently?

Just as surely as the work-bag is finally finished, just so surely does the child gain an insight into French literature which will make of him a broader, more sympathetic agent in the evolution of society.

In this country, particularly in the city, every teacher should be able to teach in one living language besides her own. *This can be done.* Nor is it so difficult as it seems. If in every school where languages are taught the teachers began the study with the little children, they would soon find themselves capable of teaching in their own classes. The special teacher would then bend all her energies in bringing the work continually to a higher and higher level.

Not only are teachers at present ignorant of all languages except their own, but German, Italian, and even the little bit of French existing in Chicago are being buried on account of ignorance.

Again and again it happens that father and mother are German, and would like to speak German, but the children are ashamed of their tongue and refuse to speak it. The second generation almost entirely forgets the mother-tongue. This is a dreadful, a really terrible condition of things.

What is the cause? The scorn and laughter the poor little foreigner meets with in the new country—scorn and laughter caused by ignorance of the language.

Now if the language-growth had gone hand in hand with the other image-growths of the American child, would there not be sympathy and understanding for the little foreigner? His coming would be a help, an inspiration. He may perhaps have the joy of feeling that he is not only receiving, but that he is to a certain extent also giving.

Moreover, it is impossible (I am speaking now of the public schools, in which there are many children of foreign parentage) for the teacher to have full understanding of the character she is helping to

develop if she is incapable of understanding the child's language, and through it his emotions, his longings, and his spirit.

If other schools in America and in Europe would but join the Chicago Institute in its effort to teach languages in this way, the work would almost do itself. A student on reaching the restless high-school years could go abroad and pursue his studies in a foreign land without breaking up his school-life. To a foreign child it would mean even more than to our own. In such a plan teachers might exchange as well as pupils.

We read Europe as a country of the past. Such a school system would save it, and make it, as well as America, a country of the future. Such a system would help to make us all world-citizens, and as this unity of the human race approached, languages would mingle and intermingle until the strongest and best in each would go to form the perfect speech of man.

French Reading Lessons

Descartes

Je veux apprendre à l'homme à penser par lui-même! Ah! C'est à la recherche de la *vérité* que je veux consacrer mon temps, ma fortune, toutes mes facultés!

Personnages: Descartes, Mersenne

Mise en Scène.

Personnages: Descartes, Mersenne.

Descartes debout devant la cheminée.

Mersenne assis devant la cheminée lit une lettre à haute voix.

Mersenne. Galilée est coupable d'avoir émis cette opinion: Le Soleil est immobile, c'est la terre qui tourne. Le pauvre homme est arrêté, emprisonné, peut-être même torturé, en tout cas il sera forcé d'abjurer.

Descartes. Mon Dieu, tu dis qu'il est emprisonné, torturé! Ah! Il faut que je brûle mon "Traité du Monde." (Il sort précipitamment puis il rentre tenant son "Traité du Monde" à la main, il se promène avec agitation, puis il s'approche de la cheminée et se hâte de le brûler.) Pauvre Traité, pauvre Copernic, c'est votre système! Mais il faut que je songe à l'avenir: je travaille pour les hommes pas encore nés; la réputation pour les vivants me préoccupe peu. (S'asseyant dans un fauteuil.) Ah Mersenne, *je pense* donc *je suis*, mais, mais le cœur a des raisons que la raison ne connaît pas!

Pascal

Toute notre dignité consiste dans la pensée. Travaillons donc à bien penser, voilà le principe de la morale.

Mise en Scène.

Chambre de travail chez le père de Pascal. Pascal, âgé de douze ans, assiste avec curiosité son père qui écrit un traité de science.

Pascal. Papa, qu'est-ce que c'est que la géométrie?

M. Pascal. Mon enfant, la géométrie apprend l'art de faire des figures exactes et de trouver des proportions qu'elles ont entre-elles. (Pascal s'assied derrière son père. La réponse de M. Pascal le jette dans la rêverie la plus profonde. Tout à coup il se lève, il renverse presque le siège de son père, vivement il s'empare d'un morceau de charbon, et se met à tracer des figures sur le carreau.)

M. Pascal. Que fais-tu mon fils?

Pascal. Je cherche ce que valent les trois ouvertures de cette figure! (La figure était un triangle, l'enfant cherchait la valeur des trois angles.)

Pascal. Ceci, mon père, (c'était un cercle) j'appelle un *rond*; cela (c'était une ligne) j'appelle une *barre*. (On frappe à la porte, M. Pascal ouvre la porte, il voit un de ses amis, mais épouvanté de la puissance du génie de son fils, il demeure immobile

et sans voix. Il pleure. L'ami croit à un malheur.)

L'Ami. Mais qu'avez-vous donc, M. Pascal? Vous est-il arrivé un malheur?

M. Pascal. Non, non mon cher ami, je pleure de joie! Avec une simple définition, mon fils vient d'inventer les mathématiques.

La Fontaine

La Fontaine, dans un fauteuil. Il est malade, air languissant. De temps en temps il détourne la tête pour mieux voir Mme. de La Sablière, qui arrange des fleurs dans un vase.

Domestique. Madame, Monsieur Boileau et Monsieur Racine désirent vous voir.

Mme. de la Sablière. Faites les entrer. (Elle va à la porte. Boileau et Racine entrent.)

Racine. Nous venons exhorter La Fontaine à songer à sa conscience, il a de grandes fautes à se reprocher.

Mme. de la Sablière. Lui, Messieurs, il est simple comme en enfant. Si'l fait des fautes, c'est donc par bêtise plutôt que par malice! Ne le tourmentez pas!

The children, in dramatizing their stories, were troubled with the verbs, the tenses, particularly the descriptive and historic past. They asked to have a few lessons devoted particularly to a discussion of the verbs. The following reading lesson is the result of the children's questions and answers:

Jean. Je ne comprends pas très bien l'emploie des temps. Je confonds aussi les auxiliaires. Veuillez bien nous faire la leçon sur les verbes aujourd'hui?

Mlle. Guinand. Certainement! Il vaut bien la peine de passer quelques heures à faire connaissance avec la partie du discours qui donne le sens et la vie, qui est l'âme de la phrase. C'est le verbe qui existe, qui agite, qui sent, qui souffre. Jeanne, dites moi combien de temps il y a dans l'indicatif.

Jeanne. Je crois qu'il y en a huit.

Mlle. Vous avez raison. Quels sont ces huit temps?

Jeanne. Le présent—

Mlle. A propos, qu'est-ce que c'est que le présent, Robert?

Robert. Le présent marque le moment où l'on parle, n'est ce pas, mademoiselle?

Mlle. Oui Robert, quel autre temps pouvez-vous m'indiquer?

Robert. Le passé et le futur.

Mlle. C'est cela. Avons-nous un ou deux passés en français, Hélène?

Hélène. Je crois qu'il y en a deux, mademoiselle, mais je ne les comprends pas.

Mlle. Nommez moi ces deux passés.

Hélène. L'imparfait et le passé défini.

Mlle. Eh bien, un passé qui est défini est un fait qui est passé, il marque à quel moment même du passé le fait s'est accompli. Nous sommes sûrs du passé de bien peu de choses. Il arrive qu'en parlant de la naissance, de la mort, de faits historiques, nous pouvons employer le passé défini. Il nous faut alors un autre passé, lorsque nous parlons de quelque fait commencé et qui peut continuer. Par exemple, je vous parlais hier, c'est bien passé, mais je vous parle de nouveau aujourd'hui. Cet autre passé, c'est l'imparfait, un passé imparfait.

Voici, ce qu'en dit Monsieur Sauveur. "C'est le temps qui marque qu'un fait qui était en voie de s'accomplir au moment où un autre fait passé s'est accompli ou bien au moment ou un autre fait passé allait s'accomplir."

J'écrivais sur le tableau noir lorsque mademoiselle m'a questionnée.

J'écrivais sur le tableau noir. J'avais commencé. Je continuais quand vous m'avez fait votre question au sujet des verbes.

Une action qui dure, une action qui se

répète souvent est marquée par l'imparfait —un temps passé, descriptif, narratif.

Comprenez-vous ce que je viens de vous expliquer?

Hélène. Oui mademoiselle. Je vous remercie de votre explication.

Mlle. Il nous reste encore le futur, qu'est-ce qu'il marque.

Jean. Qu'un fait aura lieu dans un moment qui vient après celui où l'on parle.

Mlle. Très bien, nous avons donc le présent, l'imparfait, le passé défini, le futur. Ces temps sont-ils simples?

Jeanne. Je crois qu'oui, mais je ne comprends pas très bien la différence entre un temps simple et un temps composé.

Mlle. Dans un temps simple l'affirmation est marquée par la flexion du verbe; j'écris, j'écrivais, j'écrirai.

Les temps simples sont formés d'un seul mot.

Les temps composés sont formés d'un auxiliaire et du participe passé du verbe.

Le temps composé du présent est le passé indéfini qui marque que le fait a eu lieu dans un moment indéterminé avant celui où l'on parle.

Le temps composé de l'imparfait et le plusque parfait, qui marque qu'un fait s'est accompli à un moment quelconque avant un autre fait, qui est lui-même passé.

Le composé du passé défini est le passé défini est le passé antérieur, qui marque qu'un fait s'est accompli à un moment déterminé, au moment qui a précédé immédiatement un autre fait qui est lui-même passé.

Le composé du futur est le futur antérieur qui marque qu'un fait futur s'accomplira avant un autre fait futur.

Voilà qu'on sonne! nous continuerons cette leçon la semaine prochaine.

Je vous excuse, mes élèves.

* * * * * *

Mlle. Nous avons bien réalisé vendredi dernier que pour être à même de bien conjuguer un verbe il nous faut comprendre l'auxiliaire, le verbe qui aide à conjuguer les autres verbes.

Combien de verbes serviteurs, d'auxiliaires avons-nous, Jeanne?

Jeanne. Deux—avoir et être. Avoir est le seul verbe qui se conjugue sur lui-même, n'est-ce pas, mademoiselle? Parceque l'auxiliaire être est conjugué sur avoir.

Mlle. A quelle famille de la nation verbe appartient l'auxiliaire avoir, Robert?

Robert. Je ne sais pas.

Mlle. Est-ce que personne ne peut me le dire?

Jean. A la troizième mademoiselle, celle qui a *oir* pour terminaison.

Mlle. Que voulez-vous savoir, Henri?

Henri. Je ne comprends pas terminaison.

Mlle. Veuillez le lui expliquer, Hélène.

Hélène. J'essayerai mademoiselle.

Le verbe se compose de deux parties bien distinctes, une partie qu'on appelle radical ne change pas, l'autre partie qui change continuellement s'appelle terminaison.

Il est toujours très facile de trouver le radical d'un verbe donné, si l'on met le verbe au présent de l' infinitif et si l'on retranche la partie qui indique à quelle conjugaison il appartient, par exemple, aimer, retrancher, la terminaison *er* et vous avez le radical *aim*, qui ne change jamais.

C'est clair, Henri?

Henri. Oui, cependant je ne comprends pas encore les familles du verbe.

Mlle. Eh bien. Jeanne vous les fera comprendre.

Jeanne. En Français tous les verbes qui se terminent à l'infinitif en *er* appartiennent à la première famille, c'est à dire à la première conjugaison, comme aim*er*.

A la deuxième conjugaison appartiennent tous les verbes qui se terminent à l'infinitif en *ir*, comme fin*ir*.

La troisième famille comme je viens de

vous le dire se termine à l'infinitif en *oir*, comme rece*voir*.

La quatrième se termine à l'infinitif en *re*, comme rend*re*.

Mlle. Bravo Jeanne. J'écrirai maintenant la conjugaison du verbe auxiliaire avoir sur le tableau noir.

Avoir, ayant, eu, ai, eus.

Mlle. Que voulez-vous savoir Jeanne?

Jeanne. Qu 'est-ce que cela vient dire—avoir, ayant, eu, ai, eus?

Mlle. Votre question est opportune.

On distingue dans les verbes des temps primitifs, ces temps servent à former les autre temps, qu'on appelle temps dérivés.

Il y a cinq temps primitifs.

Le présent de l'infinitif.

Le participe présent.

Le participe passé.

Le présent de l'indicatif.

Le passé défini.

Le présent de l'infinitif forme deux temps: Le futur et le conditionnel.

Le participe présent forme trois temps: Le pluriel du présent de l'indicatif, l'imparfait de l'indicatif, le présent du subjonctif.

Le participe passé forme tous les temps composés.

Le présent de l'indicatif: L'impératif par la suppression du pronom et l'on retranche *es* finale à la deuxième personne du singulier dans les verbes de la première conjugaison.

Du passé défini on forme: L'imparfait du subjonctif.

Mlle. Oui. Hélène, vous avez encore une question à m'adresser?

Hélène. Oh! c'est ce subjonctif, jamais de la vie je n'y verrai clair.

Mlle. Guinand. Ne dites pas cela, Hélène, vous arriverez bien à bout de cette difficulté. Mais aujourd'hui ne parlons plus de verbes. L'emploi du subjonctif sera pour une autre leçon. Prenons "La Belle Nivernaise" et lisons quelques pages. Ce sera le dessert de notre leçon.

Physical Training

Carl J. Kroh Caroline Crawford

It is the purpose of the Physical Training Department to outline by the close of the year a graded course of gymnastics, adapted to the various grades. This course will be based on the following divisions of subject-matter:

I. Tactics. Order Exercises: Relative positions. Movements of the individual, rank, column. Movements on place; from place. Formation of ranks and bodies of ranks; columns. Formations in and of ranks; transformation of bodies, etc.

II. Free Standing Movements and Exercises: Exercises without the use of apparatus. Movements of the head, shoulders, arms, trunk, legs, feet. Elevation, flexion, extension, rotation, circling.

III. Light Gymnastics: Free standing movements and exercises with the use of hand apparatus, as dumb-bells, Indian clubs, wands, poles, rings, elastic bands, sacks, balls, etc.

IV. Apparatus Gymnastics: Exercises on gymnastic apparatus, as horizontal and parallel bars, ladders, rings, poles and ropes, round swings, vaulting machines, etc.

V. Athletics: Jumping, running, pole-vaulting, putting the shot, etc.; wrestling.

VI. Plays and Games—recreative and competitive. Antagonistics.

VII. Special Work: Foil, sword and bayonet fencing; exercises with the single-stick; boxing, etc.

VIII. Remedial work.

Defensive exercises, as fencing and boxing, preparatory to special practice, are included under I, II, and III.

Work designated assistive, resistive, cooperative, as physical work without apparatus, implies the reliance of gymnasts upon each other in the execution of exercises; assistance

or resistance being required of one or the other, or several—according to the purpose intended. The substitution of pupils in lieu of gymnastic apparatus includes work under this head.

Esthetic, "artistic" gymnastics find their highest expression in gymnastic compositions and "roundels," suggestive of interesting "themes." They include tactics and activities illustrative of definite gymnastic thought, generally accompanied by music or singing.

Fancy steps are derivations of the forms of exercise occurring under I and II, with rhythmic changes in execution. In their execution the body as a whole participates, as in walking, gliding, skipping, hopping, bounding, etc. They are considered in their regular place in the order of adaptations.

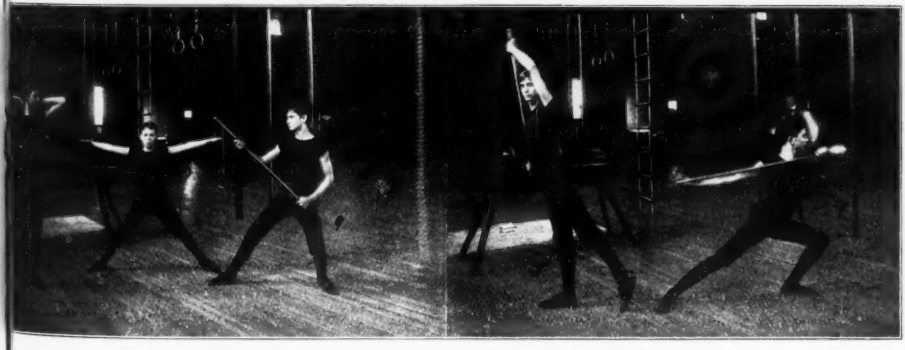
Remedial work, a special form of work, is applied to defective and nervous children. As corrective work, it includes work for most ordinary defects, superinduced by forced durance in schools, etc. It consists of movements, free exercises, standing, sitting, lying; of assistive and re-istive work, carefully adapted and prescribed with reference to individual needs.

Free Exercises

Free standing movements and exercises of the first order consist of: Positions and simple movements; simple exercises and combinations; complex movements and exercises; and combinations.

Movement forms include elevation, as of the arms and legs; flexion and extension; also rotation and circling of the head (neck), trunk, arms, and legs; turn-bending of the head and trunk. Other forms, as stretching, swinging, striking, and thrusting, imply variations in modes of execution.

The basic positions embrace: (1) Half-stride positions, the fundamental and



Positions shown in cuts: (1) half-stride; (2) fundamental; (3) close-standing; (4) step; (5) half-standing; (6) stride; (7) lunging; (8) reverse-lunging; (9) fencing; (10 and 11) tip-toe and bent-knee positions.

close-standing positions, step positions, and half-standing positions; (2) stride positions, lunging positions, reverse lunging positions, fencing positions. These positions, with modifications, are repeated with heel-elevation, single and double knee-bending, and with heel-elevation and knee-bending combined.

Starting positions of the arms, used in connection with the different movements of the body and its parts, are: Arms next sides, hands grasped backward, hands grasped backward with arms bent, hands placed on hips, arms bent to thrust, arms bent upward, hands placed on the chest, ditto on the shoulders, ditto behind the neck, single and double arm extensions forward, sideward, and upward.

The order or succession of types of exercises suggested for lessons consisting exclusively of free standing movements and exercises, designed to bring into use the various groups of the entire muscle-system with each recurring lesson, was stated in the November issue of the COURSE OF STUDY.

The order of direction followed in the execution of simple and complex movements and their combinations, when not otherwise determined by the type of movement, is forward, sideward, and backward, upward in front, and sideways. The same order of direction is indicated in different planes; i. e., height of ankles, knees, hips, chest, shoulders, head, and reach. The various movement combinations are of similar and dissimilar kinds. They are executed in alternate, intersected, and simultaneous order in the same, opposite, and different directions.

A position usually denotes a standing attitude, as a stride or step position. A movement corresponds to the action expressed in the respective command, as "raise!" or "sink!" An exercise consists of at least two distinct movements repeated rhythmically, as "raising" and "sinking." A movement as well as an exercise is termed simple when involving only one form of action, as when a part, as the head or trunk, is flexed or rotated; or when two like parts of the body, as both arms, are raised and lowered; it is termed complex when involving more than one form of action, as in an extension with rotation of the arms. Simple movements and exercises of parts as a whole precede complex movements and exercises. Positions and movements, as well as changes in positions and movements, are practiced to command only. Rhythmical execution of "exercises," simple, complex, and combined, to signal or other accompaniment, follows only when warranted by good and accurate execution of positions or movements comprising an exercise. The different standing positions, as well as the starting positions of the arms, serve various purposes. The standing positions represent the bases, in a measure determining difficulty of execution and effects of exercises. The proper adaptation of the starting positions of the arms conduces to a concentration of effort.

Springing Exercises

APPARATUS, POSITION, START, ALIGNMENT: Four or more rubber-covered spring-boards, with the highest edges placed in line on the off-side, at a distance of about ten feet from the head or front of a class in open order, numbering four or more files, eight to ten ranks* deep, one arm's-length distance between ranks, and two arm's-length distance or more between files; four or more mats, placed lengthwise at a distance of two or more feet from the spring-boards (off-side). Pupils leave head of files for positions on boards and align in the rear of the class, passing left (or right) of files after execution of exercise upon the command "March," the class moving forward a step or two with each succession.

The jumping may be preceded by a review of the movements, occurring in the following order, in class practice: Arm and leg exercises practiced separately and together; the first arm movement, to the position on tiptoe, made in the direction of the jumping movement; the second arm movement, to the position with knees bent, made in the direction opposite to the jumping movement; the jump, arms carried in the direction of the jumping movement during the flight from board to mat. Practice forward, backward, and left and right.

*_Ranks_ consist of successive numbers — 1, 2, 3, 4 — pupils standing next each other in "front order," counting from right to left. _Files_ consist of all like numbers, pupils standing behind each other in "flank order."

I.

START: Fundamental standing position on the board.

1. Raise arms forward to stand on tiptoe—*one!* Lower arms (position backward) and bend knees—*two.!* Jump forward—*three, four.*

At "three" the pupils jump and swing the arms forward, straightening the body during the flight, and alight gently to bent-knee position, quickly resuming the fundamental position at "four." The landing must result in a proper standing position before the following order is announced.

Move boards backward two or three inches with each repetition (last rank) until "limit jump" of majority is reached. (Occasionally command upward, sideward, or side-upward swinging of arms to flight.)

2. Practice backward jumping over first distances.

Arms are swung in the direction of the jump. Ex.: Raise arms backward, on tiptoe—*one!* Arms forward, bend knees—*two.!* Jump

backward—*three, four.* Arms are vigorously swung backward during the flight and lowered to resume the fundamental standing position.

3. Repeat jumping forward from a walking start, leaving the board with both feet.

(Exercises may be preceded by a double hopping start on the boards—girls.)

4. Repeat with running starts, landing on the board, as above, with both feet to jump.

5. Repeat exercises without boards and mats, marking starting and landing places.

II.

Repeat exercises under I, hands weighted with dumb-bells (one or two pounds).

Swinging the arms vigorously in the direction of the jumping movement is effective in securing better execution.

III.

Repeat exercises under I, executing movements (exercises) during the flight, as raising left, right, or both knees forward; legs (flexed) backward; side or cross striding, turning, with appropriate arm movements. Touch left, right, or both feet, knees raised forward, or legs raised backward (flexed), etc.

(Add exercises to the landing, as rolling over forward to stand—in connection with facings, etc.—for boys.)

IV.

APPARATUS: Jumping standards, ropes one to three feet high over center of distance—raised one notch with each repetition.

1. Repeat above exercises.

2. Repeat exercises, moving jumping standards toward the board or mat. Increase distances; raise ropes. (Long high-jumping; high broad-jumping.)

APPARATUS: Jumping standards, boards, mats. (Boards placed close to mats; ropes resting over mats. Move standards forward when necessary.)

I.

Jump as above, increasing height one or two notches with each repetition (until limit jump of majority is reached.)

Repeat, executing quarter facings left and right after clearing rope.

II.

1. Repeat height-jumping, side-striding during flight. (Running starts.)

2. Repeat, executing facings (quarter and half facings) during flight.

III.

Repeat, height-jumping, executing facings before clearing rope (clearing sideways, knees raised, or legs extending forward.)

IV.

Height-jumping. (Standing, walking starts, short running starts.) [Always begin a few inches below the height all can jump.]

Repeat height-jumping over two ropes, three to six feet apart.

Repeat height-jumping between two ropes—one placed above the other, about four feet apart.

Repeat, decreasing space between ropes.

1. By raising lower rope, or by lowering upper rope.

2. By lowering uppermost and raising lower ropes.

3. By moving jumping standards closer.

Home Economics

Alice Peloubet Norton

In almost every place where cooking has been introduced it has been something apart by itself, with no relation to the other work of the school. If it is to be made of the most value in the training of the child it must become an integral part of the work. An attempt to bring this about has been made in the Fifth and Sixth Grades, where the cooking is a part of the nature study, and is kept in close relation to the history and geography (see grade outlines). Taught in this way the work becomes a mode of self-expression which adds to the clearness of the images in the child's mind.

In the Sixth Grade the experiment is under way of giving part of the cooking lesson in French, thus aiding the children who are studying this language to become easily familiar with French words and phrases, because used in connection with their activities. The results of the experiment will be recorded in the March COURSE OF STUDY.

Pedagogic School: Each lesson in the pedagogic school is devoted partly to a general discussion of the food materials studied, with experiments to determine their nature, and partly to the actual cookery of the foods.

Some of the experiments which have been used during the last few weeks are here given:

I. Test for sugar.

1. Dip the end of a clean glass stirring rod in some glucose. Dissolve the glucose that adheres in a very little water. Add 5 c. c. of dilute copper sulphate solution and 5 c. c. of strong potassium hydrate solution, or enough to dissolve the precipitate formed. Boil for a moment. Compare with the result obtained by boiling the same amounts of copper sulphate and potassium hydrate solutions without the glucose. The mixture of copper sulphate and potassium hydrate is known as Fehling solution.

II. Change of cane sugar to glucose.

1. Repeat the last experiment, using a little cane sugar instead of the glucose.

2. Take about 5 c. c. of a solution of sugar, add ten drops of hydrochloric acid and boil for fifteen or twenty minutes. Then neutralize the solution with sodium carbonate and test as before.

3. Test 10 c. c. of milk for sugar.

III. Change of starch to dextrin and sugar.

Heat carefully in an evaporator about 5 grams of powdered starch, with constant stirring. After heating for about ten minutes, let the dish cool, add water, and boil. Filter the mixture, and to a small portion of the filtrate add twice its bulk of alcohol. To the remainder of the filtrate add 1 c. c. of hydrochloric acid, and boil until a drop of the liquid taken out gives no color with a drop of iodine solution. Neutralize the solution with sodium carbonate, and test for sugar.

IV. Change of starch to sugar by the action of saliva.

To 5 c. c. of thin starch paste, in a test tube, dad an equal amount of saliva. After two or three minutes test a small portion for sugar as in the previous experiments. If no result is obtained, try again at the end of five minutes.

In the cookery a special attempt has been made to show the underlying principles and to group similar recipes together under one head. The principles of cookery are few and simple, and are only repeated in different form in the multiplicity of "dishes" made. In selecting the rules to be used care has been exercised to take those which best illustrate the principle involved. Whenever there is an apparent violation of this principle the reason for it must be carefully explained. In the preparation of both egg and meat dishes, for example, the principle is that of albumen cookery. Soft custard,

creamy eggs, stewed meat—all illustrate well the use of the low temperature. Roasting and broiling of meat, and the making of omelet, each requiring a high temperature at the beginning, would seem directly to violate the rules laid down, until it is seen that the mass of material is not raised above the required temperature (80° C.), and that the outside layers are sacrificed for definite reasons.

The work for February will include gelatine dishes, with a review of custards; vegetable soups; combinations of starch and albumen, in cream tapioca, chocolate cream pudding (prepared with corn starch), and macaroni or rice scalloped with cheese. One lesson will be given to the observation of a class in cookery, and the method of teaching it will be discussed.

Some of the recipes used are given below:

Custard

General rule:

1 cup milk.
2 tablespoons sugar.
1 egg.
¼ teaspoon of flavoring.
Speck of salt.

This may be made into soft custard, baked custard, or steamed custard, according to the method of cooking.

Soft Custard: Heat the milk in the double boiler. Beat the egg slightly and add the sugar and salt. Pour the hot milk gradually upon the mixture, return to the double boiler, and cook, with constant stirring, till the custard thickens, and will heap up on the spoon. Strain immediately into a cold dish and flavor.

Precaution: Do not over-cook, or the custard will curdle. Keep the water in the double boiler just below the boiling point. (A vigorous beating with a Dover egg-beater will often restore the smooth texture to a slightly curdled custard.) Do not beat the eggs too light.

Variations: Caramel custard may be made by boiling the sugar with an equal amount of water, without stirring, till a light brown color is reached, and adding this to the hot milk before combining with the egg. For chocolate custard, melt ¼ ounce of chocolate with 1 tablespoon of water and 1 tablespoon of the sugar, and add to the milk before combining it with the egg and the remaining sugar.

Two egg yolks may be substituted for the whole egg. A white custard may be made by using two whites of egg in place of the whole egg. This is usually steamed by filling cups with the mixture and setting them in a pan of hot water on the stove, covering, and cooking till firm, without stirring.

Baked custard may be made by mixing the given ingredients and baking in a moderate oven until the mixture is firm, and a knife-blade thrust into it will come out clean.

Cream of Tomato Soup

1 can tomatoes.
2 teaspoons sugar.
1 teaspoon salt.
¼ cup flour.
2 tablespoons butter.
1 quart milk.

Add the salt and sugar to the tomatoes and cook till soft; mix flour and butter together and stir into the tomato; cook five minutes more, strain and cool. When cold, add the cold milk, heat and serve.

(The cooling of the tomato is for the purpose of preventing the curdling of the soup.)

In giving the lesson on cream soups, several different kinds should be chosen, and the pupils, by comparing the different recipes, should deduce a general rule. It will be seen that in all cases the principle is that of a white sauce, generally with the addition of a vegetable. The amount of flour used will depend on the thickening power of the vegetable, that is, on the amount of starch which it contains. The flour cannot be omitted (except where a starchy vegetable is cooked for hours, as in the case of split-pea soup made in the Aladdin oven) for the vegetable and liquid tend to separate.

Cooking in the Primary Grades

Flora J. Cooke

Milk: In comparing their own winter foods with the chief food of the Eskimos the children will be interested in discov-

ering the sources and uses of the oils and fats used as food.

In this connection they will experiment with milk, each grade attempting to make butter good enough to serve at luncheon to the other grades. They will first set a certain quantity of milk under various conditions of temperature, in cold water and in deep and shallow pans, and measure the amount of cream which rises during twenty-four hours.

They will be allowed to find out for themselves just how to make the cream into butter. The Third and Fourth Grades may use *Stories of Industry*, Volume II (pages 100 to 108, inclusive), as a text-book. The First and Second Grades will have pictures and data provided at school, and will find out all they can at home about making butter.

Each child will then churn, wash, salt, and serve the butter according to his own judgment. He will note and record the results of his experiments, and will discover the difference in the color, taste, and consistency of whole milk, skim-milk, sour milk, buttermilk, and whey. They will also make and serve cottage cheese during the month.

Recipe 1:

Each child will take one-half cup of milk.

If we allow one-quarter cup of lemon juice to one quart of milk, estimate how much lemon juice should be given to each child.

Put the lemon juice in the milk, and allow it to stand until coagulated.

Heat slowly, but do not boil until the whey and curd have separated. Turn all into a colander lined with a square of white cheese-cloth, and drain off the whey.

Add to the curd a little salt and cream, and mix all together into the form of little cakes or balls for the table.

Recipe 2:

Milk that has soured naturally may be placed in a pan over a kettle of hot water until the whey settles to bottom of the pan. The curd may then be treated and served as in Recipe 1.

Number work in this connection, as explained in previous numbers of the COURSE OF STUDY, will consist in the careful measuring and weighing of the materials, in estimation of amounts to be used in the testing of temperatures, and in keeping of the necessary accounts as to the cost of materials for the month, and in the finding of each person's share of the expenses.

Reading: Many books and pictures for reference in this study will be placed in the library where the children may have free access to them. Paragraphs in these books that are especially adapted, or that bear directly upon the child's experience, will be marked by the teacher. The children may use the stories and facts thus gained in entertaining their guests during the luncheon at which their own butter or cheese is served.

From Mrs. Kellogg's *Science in the Kitchen* selections will be made describing the Oriental method of churning butter in a goat's skin, and the butter of Jerusalem. Parts of *A Dog of Flanders* may be read to advantage. From the encyclopedias, and the various geographies and histories, stories will be compiled by the teachers illustrating the use of cow's butter and oil in Greece and Rome; of butter and oil from olives and coacoanuts, and of animal oils and fat as used by the Eskimos.

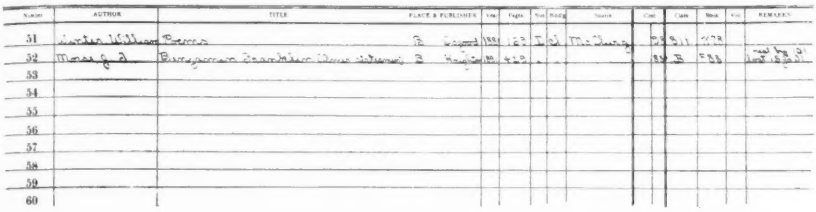
References: *Milk as Food*, Farmers' Bulletin, No. 74; Knight, *Food and Its Functions;* Webb, *Butter-Making;* Wing, *Milk and Its Products;* Mrs. Kellogg, *Science in the Kitchen.*

Organization of a Library

Irene Warren Frances Simpson

Accession Book: Every book should be carefully recorded as soon as it has been checked with the bill and collated. A blank book with the proper headings and known as an accession book has been made for this purpose. It may be secured in a morocco-bound volume of five thousand entries, in press-board with one thousand entries,

or in single sheets. A sample of the page is here given to show the entries:



Number	AUTHOR	TITLE	PLACE & PUBLISHER	Vol.	Pages	Illus.	Binding	Source	Cost	Date	Book	Vol.	REMARKS
51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
52	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
53													
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60													

The accession book contains the life history of every book from the time it enters the library until it leaves it. A list of rules for entering books is given in the front of each book, and may also be found in the New York State Library School *Rules for a Catalogue*.

Each volume is given the number of the line on which it is entered. This number is placed on the lower margin of the first recto after the title-page. The same number is never assigned to two books, even if the first one is lost or sold, or an exact duplicate is obtained. Where there is a large collection of books, the Bates numbering stamp will be found a great convenience in stamping the accession number on the books.

A list of abbreviations is given in the front of the accession book which should be used in entries. Under the heading "Source" the name of the giver, if a gift, or the firm from whom bought, is given. Under "Cost" the actual amount paid in dollars and cents should be given. Under "Remarks" the rebinding, loss, or anything of value in the book's history should be recorded.

Marks of Ownership: Every book belonging to the library should bear the official name of the library. Care should be taken to deface the book as little as possible. A perforating stamp is the safest mark, but an embossing stamp or rubber stamp may be used. Every book should be stamped on the upper right-hand corner of the title-page, and also on the same corner of the main paging of the book. A little of the print should be taken in each time. If there are valuable plates in the volume they should be stamped on the middle of the back with a small, neat rubber stamp.

Labels: Every book should bear a label on the back where the class number can be plainly printed on in Higgins' Black Waterproof ink. A plain white gummed label, oval, or with clipped corners, as in the Dennison No. 16A, is the neatest and most serviceable. A little household ammonia rubbed on where the label is to be pasted will take the glue out of the binding and make the label adhere. A piece of leather cut about the width of the back of an average book and about four inches long, with a hole the size of the label cut three-quarters of an inch from the bottom, will enable the person pasting to keep the labels even. This adds greatly to the appearance of the library.

Discussion of the Programs of Work in the Primary Grades of the Chicago Institute

Flora J. Cooke

Correlation of Work

It was made evident in the discussion of an ideal course of study at the Illinois State Teachers' Association at Springfield, that the programs and grade outlines which appear each month in the COURSE OF STUDY do not clearly represent the work done by the children of the Chicago Institute.

A fixed program is at best a most artificial thing. That in the Chicago Institute grows out of a consideration of the right of the whole school community to the use of the physical and manual training rooms, and that of each child to his share of the teacher's attention. For the sake of a clearer discussion, we take the liberty of presenting the program for the First Grade for the present quarter. The programs of the other three primary grades are similar, with the exception that the teacher of French assists Miss Van Hoesen in the Third and Fourth Grades in giving one literature, one sloyd, one sewing, and one nature study lesson each week. Thus the children learn French incidentally by the same general method that they learned to speak, read, and write English; i. e., through imitation, and prompted by a desire for expression, and by a normal childish curiosity, they soon begin to speak and read French.

It will be understood that the program given below is only a general guide. It can be changed and shifted to suit the special necessities of the children whenever such changes do not interfere with the movement of other classes in the school. For instance, history is down on this program for Monday, Tuesday, and Wednesday, and geography for Thursday and Friday. As the geography is only another phase of this same work, it may be better to emphasize the geographical aspect on Tuesday rather than on Friday, and this will often be done. Again, they may need to observe in history on Monday, read in history on Tuesday, and write on Wednesday; or it may be better to have all three forms of work in one lesson each day. Therefore it is manifestly impossible to put down upon the program exactly what the children will be doing at a given time. Yet all modes of study are as a rule considered as absolutely essential to the study of any subject worth thirty minutes of the children's time.

It was asserted at the State meeting that twenty-two separate activities were demanded of the primary children of the Chicago Institute each week, and that reading, writing, and number received almost no attention according to the grade programs. Such an interpretation of the programs may be natural from a first glance at them, but it is utterly wrong. There is absolutely no isolated activity demanded for the sake of the practical training gained through that activity. The children do not take, as implied, an eight-year graded course in sewing, cooking, sloyd, painting, and modeling for the sake of learning to do these manual things. Such training, per se, surely does not belong to a public school education. These activities are in every case used by the children as means to some

FIRST GRADE PROGRAM, WINTER QUARTER

TEACHERS.	ROOM.	HOUR.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.
Cooke Atwood Allen Atwood	A. & C. A. of S. 8 5	9:00 to 9:30	Cooking.	Nat. Study.	Rhythm.	Rhythm.	Nat. Study.
Cooke Atwood Atwood Hollister	A. & C. A. of S. 5 Sloyd.	9:30 to 10:00	Cooking.	Art.	O. Read.	Nat. Study.	Clay.
			TEN-MINUTE RUN.				
Cooke Atwood	5 5	10:10 to 10:40	Literature.	Number.	Seat Work.	Literature.	Number.
		10:45 11:05	MORNING EXERCISES.				
		11:05 to 11:30	LUNCH.				
Atwood Cooke Goodrich	5 Lib. 5	11:30 to 12:00	Number.	Library.	Music.	Geography.	Geography.
Atwood Crawford Champlin	5 Gym. Sloyd.	12:00 to 12:30	Gen. Ex.	Gymnastics.	Sloyd.	Gymnastics.	Sloyd.
Atwood Goodrich	5 5	12:30 to 1:00	History.	History.	History.	O. Read.	Music.

A. & C. Arts and Crafts.
A. of S Academy of Science.

desired end, and the child merely uses all his mental and physical powers to accomplish that end. He is thus trained naturally and incidentally as the race was trained, and he acquires skill through the rational use of his mind and body in work and play. Thus the doing of many things during a day does not necessarily mean mental dissipation; it may be exactly the opposite thing—strong image growth, concentration, thoroughness in one piece of work.

For instance, suppose during the day that a child plans to make a dictionary.

In manual training he measures and cuts it out.

In number he finds out how many leaves he needs to hold the alphabet, if one sheet makes two leaves; also how wide the cloth binding must be, allowing one-half inch on each side for pasting, etc.

In sewing — seat-work — he makes his leaves and sews them together.

In nature study that day he perhaps adds to his vocabulary five words, printed or written, which he will place in his dictionary for reference and use.

The drawing and painting demanded in this case would probably be only the drawing and painting of the stenciled word "Dictionary" for the front of the book.

Just as much of each activity is exercised as is necessary to make the object fulfill its purpose in the best way. If more space were taken, almost any central subject of study would illustrate this point better, for it would not only offer opportunities

for closer correlation of work, but its proper study would illustrate the demand for reading and the various forms of expression.

By comparing this program with the outline of work for the First Grade, it will be noticed that nature study and geography deal with our winter conditions, our food, clothing, and physical environment. This is supplemented in history and geography by the study of the Eskimo, who has the same conditions intensified. In cooking, the fats and oils are studied because at this season they are prominent in the daily food of both peoples. The children have also the added interest of making and serving a good "fatty" food, i. e., butter at luncheon.

Number is demanded for clear picturing at every step. The teacher knows what the children already have as usable knowledge and ability in mathematics, and is aware what the new work may add to that store. This is also true in language and spelling, while the music, literature, and oral reading directly reinforce the other work.

In the library periods the children will be taken to the library, where Miss Warren prepares the books and pictures bearing upon the month's work. Here they will read silently, with the teacher's help.

In the next lesson in the subject thus studied each child will write what he has found out for the benefit of the entire class. This is always one of the most profitable periods of the week, and where the children have not access to a library the same general results can be obtained in the regular class-room from the use of selected supplementary readers and reading slips. The rhythm, ten-minute run, and the physical training provided for by the program mean rest and added power in every line of work—more strength, greater power of attention, and self-control.

In manual training this month the necessity for a towel-rack and dish-pan boards in the lunch-room is a more pressing need to the children every day when they wash their dishes than any demand for work in wood presented by the subjects studied. In doing this work in committees the children will not only apply their knowledge gained last month in the study of wood, and increase their power and skill in manual work, but they will also feel their usefulness to the community in a wholesome way and begin to appreciate and assume class responsibilities.

In summing up this work it is frankly admitted that it is most crude. This article is not written to defend it. The effort is to make the programs understood, and to show why reading, writing, and spelling are not given more definite places on these programs. They are considered as intrinsic parts of all the work, and they come in daily—yes, almost every hour in the day—but they come in to help in definite image-growth, and as the exact action of the child's mind cannot be foretold, so the form of exercise for each period is left to the teacher's discretion, with the understanding that she is held responsible for the thought, expression, and actions of the normal children under her care. If the thought work is really good, the form work cannot be very poor.

The question has been asked during the past month how the subjects of study are chosen and the course of study planned. Under the general ideal of the school each teacher's part is as follows:

A special plan for each month is worked out in detail by the grade teacher. It is based upon the general year's plan for each department in the school, and upon what the teacher knows of her particular children.

It seems fair to say that the subjects selected would stand the following tests:

Each subject must be: Something concerning which the children have an in-

dividual as well as a racial experience; something that will arouse a child's self-activity—i. e., which presents or demands vigorous mental or physical action — a demand which a normal child will appreciate and respond to; something which will exert an influence in harmony with the ideal of the school.

The children will read, write, spell, and cipher in every subject; but the vital questions are: Will the particular work chosen arouse interest and sustain it? Is it really worth while in forming the child's habits of life and character?

Explanation of the Changes of Program in the Primary Grades

A change will be observed in the grade outlines for this quarter, the plan for the First and Second Grades being written by Mrs. Atwood, and that of the Third and Fourth by Miss Van Hoesen. The arrangement of placing two grades in one room with an adjacent recitation room seemed best on account of small room-space and the crowded condition of the school. The plan of work, however, has not essentially changed with the change of teachers.

It will be noticed that in many cases the higher grade children will study the subjects selected for the lower grade in the general plan for the year given in the catalogue of the Chicago Institute. That prospectus was not intended as a fixed guide, however, but was merely a hypothesis for work, founded upon previous experience with the interests and development of children of corresponding ages.

This year, as the work is new to all of the children, it seems perfectly feasible for both grades occupying one room to study the same subjects, providing that the work be well chosen and so adapted as to arouse the best effort and activity of each child. Mechanically, this plan is most economical in its demand for pictures, specimens, and reading materials in the class-room.

Better opportunities for correlation in music, literature, oral reading, and all general exercises are also provided when all the pupils of a room are studying the same things, in a general way, in history and science, than when each grade is demanding conditions and appliances for an entirely different line of work. Special provision is made for children who manifest special interest or desire for other forms of work.

Reading Lessons for the Primary Grades

SCIENCE SERIES, No. 2

(Pictures and Data, I. B. Meyers.)

Flora J. Cooke

DRAWING LOGS THROUGH THE FOREST

How Lumber Is Made

This is a picture of a forest in Pennsylvania. The trees are oaks, maples, pines, and poplars. The men in the picture are called "loggers." They are going to haul many logs to the river which you see through the trees.

First the "master logger" went through this forest. He marked all the trees to be cut down during the season. Then hard work for the loggers began — chopping and sawing, loading and hauling from morning until night.

In every marked tree the men cut notches in one side. Then

GIANT CRANE AT WORK

EXTERIOR OF SAW-MILL

they sawed across the trunks. One after another down came the great trees, crashing and breaking their way to the ground. Afterward all the large branches were sawed off.

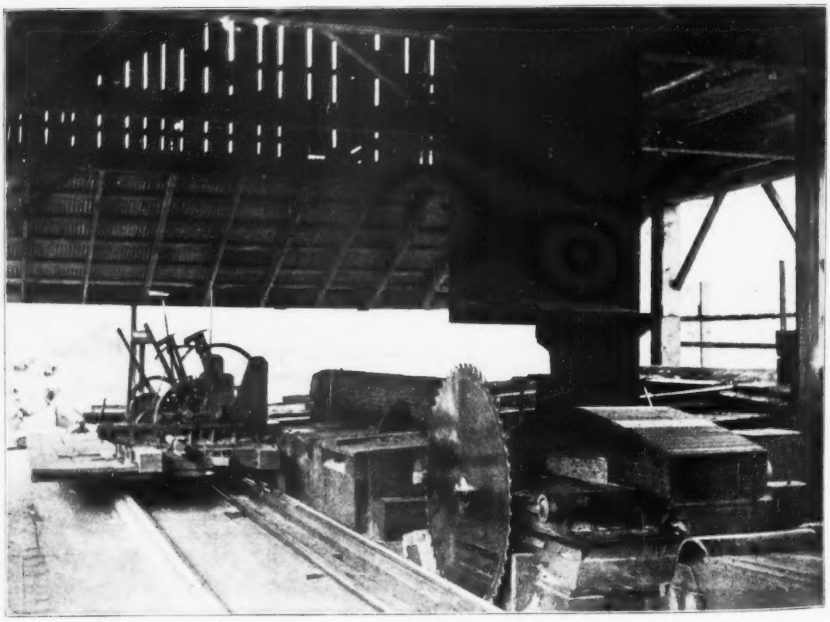
See the fine pine tree in the picture. Can you tell how many saw-logs 12 feet long it will make? The horses will haul these saw-logs down to the crane, and they will be placed in great piles like those in the picture.

The big cranes will lift the logs onto the flat-cars, and they will be carried to the great steam-mills.

Whenever it is possible, the large lumber-mills are placed near a river. This is because it is easy and cheap to float the logs a long distance in deep water. When they reach the mill they are dragged from the stream by long chains with sharp hooks on the ends. Next they are taken on an iron carriage to the big saw in the mill.

What has happened in the mill? We see no logs come out at the other end.

They have become boards — pine, oak, and maple — of different



INTERIOR OF MILL

length and thickness. They are now ready to be sent to lumber-yards all over the country.

Do you know how the work in the mill was done? Perhaps the last picture will help you to understand it.

Eskimos

GEOGRAPHY SERIES, NO. 1

Greenland is a great island in the North. It is not well named, for almost all of it is covered with very deep ice and snow.

Tribes of Greenland Eskimos live all along the western coast. Yet nowhere on the island can the people live more than twenty miles from the shore. Great mountains and rivers of packed ice and snow cover four-fifths of the land.

These Eskimos have a very short summer, but in June and July the sun does not set at all. It is daylight even at midnight. Summer is the happy time of Greenland. As soon as the ice melts, the ground is covered with a carpet of moss and flowers.

Mrs. Peary spent a year in this cold country. She tells what the children do all the long, dark, cold winter when the sun does not shine at all. She tells also about the wonderful northern lights, more beautiful than our rainbows; about the snow igloos and the kayahs; about the poor Eskimo mothers and girls who must chew all the skins before they can be made into clothes; about the patient Eskimo dogs and their habits; and about the many dangerous seal, bear, and deer hunts. It makes a fine story. Some day you may read it, and many other stories of Greenland.

This is what Mrs. Peary tells about one summer day soon after she reached Greenland. That day she wore long knit stockings and a red blanket dress which reached to her knees. Over this she wore a warm eider-down skirt and long moccasins. But this dress was not warm enough, and she soon changed it for one of fur.

She says of this June day:

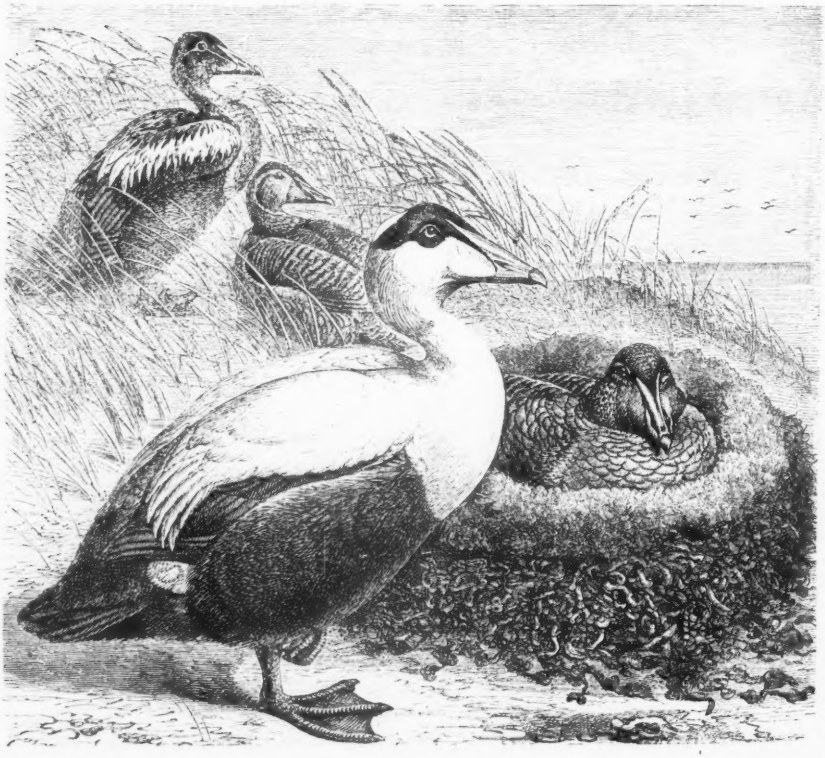
"Never had I seen so many different wild flowers in bloom at once. I could not put my foot down without crushing anemones,

yellow poppies, or mountain pinks. Never had I stepped on moss so soft and beautiful. It was of all shades of green and red. Some beds of it were covered so thickly with tiny pink blossoms that you could not put the head of a pin between them. Sometimes our path was across great snow-drifts. Sometimes we sunk ankle-deep in flowers and moss.

"Mountain streams came tumbling down in every little gully. The water was always so clear and sparkling that we longed to stop and drink.

"Far below us was Disco Bay, blue as sapphire, dotted with icebergs of all sizes and shapes. Shining in the sun they looked like a fleet of beautiful sailboats. Back of us were the black cliffs and the glittering snow as far as we could see."

Mrs. Peary's Story of the Eider-ducks



"On the morning of July 2, 1891, we arrived at Duck Island. Here we were to land to get eggs and ducks for our winter use.

"The ducks flew in thick flocks all about us. On every side were nests as large as hens' nests. They were made of sticks and moss, and lined with eider-down. Each one contained from three to six eggs. The nests were not hidden, but out on the rocks in full sight.

"Alas, we came too late! The ducks were breeding, and out of the 960 eggs gathered, only 150 were good.

"Yet it was a most successful day. I spent my time in gathering eider-down, and collected forty-three pounds in five hours, and the men of the party carried away ninety-six ducks for winter food."

In connection with this study the children may read selected paragraphs directly from Mrs. Peary's book, and *Seven Little Sisters*.

How St. Valentine's Day Came to Be

LITERATURE SERIES, No. 6

A long, long time ago there lived in France a priest named Valentine. Every one loved Valentine, but his best friends were the children of the village. They came to him with all their joys and sorrows. They understood that this friend was never too tired or too busy to listen to them and comfort them. Many children who could not come to him sent him messages by their friends. These he was always sure to answer.

After a while Valentine grew so old and so many children came to him that he was no longer able to see them all. But he still wrote hymns and verses for them, and no little friend ever left his house without a verse from Valentine. The sick and lonely children of the village were not forgotten even in his old age. His rhymes and verses were always unsigned, but every child could guess who wrote them.

After Valentine died, the people said that he was a saint who had visited the earth. It became a custom for children to send tokens of love to each other on his birthday, February 14th. They too, sent them unsigned, and to this day the custom is observed.

The Kindergarten

Anne E. Allen

A Story of St. Valentine's Day

There is an old legend that runs in this wise:

A long, long time ago there lived in France a priest who was a friend and confidant of all children. They came to him with all their troubles, sure of his sympathy and interest, no matter how small their troubles seemed to be. Their prayers were told him, and they learned from him the form of their childish petitions. The fame of his gentleness and kindly interest spread far and near, and the children came to him in such numbers that he had no time to settle all their little difficulties and disputes.

Seeing this, and feeling sorry that any child should go away from him uncomforted, he asked them to write out all their little petitions and send them to him unsigned, and said that he would burn them and the smoke would carry the little message to its destination.

Sometimes these notes were messages of love and gratitude to their kind friend. After a while the good man died, and it became a custom for the little children to send tokens of love to each other on his birthday, February 14th.

They sent them unsigned, and to this day the same custom is observed.

The Best Valentine

"But where will any valentines come from, way out here in the country? The postman doesn't come, and then there are no children near enough to send me any. Oh, dear! I wish we were back where we used to live!" The tears were in little Alice's eyes ready to fall as she stood by the window of her new country home.

Her father and mother had just moved from their town house out into the country, where they expected to live for a while. There were no houses near enough to see from the windows of this home, whereas in their town home they were to be seen from every window. And as Alice remembered her last St. Valentine's Day, when the door-bell kept her busy running to get the beautiful little messages left for her on the doorstep by loving friends, she grew sad and lonesome.

She was feeling very unhappy when her mother found her with her face pressed against the window-pane and saw the hot tears running down her cheeks.

"What can be the matter with my little girl," she said, as she folded Alice in her warm, loving arms. "Let me see if I cannot chase away some of these clouds. Look."

On the table near was a package, which Alice was told to open. The lonesomeness was soon forgotten, for in the package was a box filled with many beautiful papers, pictures, little pans of gilt and silver paints, a pair of scissors, some beautiful ribbon, and everything needed to make many valentines, enough for all the people Alice knew and many more, and envelopes, besides, to put them in. Together they set to work to make valentines, and each day before the day came to send them they worked making all sorts of shapes, sizes, and colors.

Alice was sure she had never seen such beautiful pictures as she found in that box. There were tiny babies just learning to

walk, and little white sheep and lambs; but the very prettiest ones of all, she thought, were the little white doves with letters in their bills.

When the last ones were finished, Alice began to wonder how she was to send them to so many people. When she asked her dear mother, she answered: "Ask father; perhaps he can help you."

Alice ran to him and asked him if he could help her.

"If you will get your warm coat, cap, and mittens on, and mother is willing," he said, "you shall go with me to the postoffice this morning to post them."

It did not take Alice long to get ready, and as far as she could see her mother from the carriage window she waved her hand back to her.

The postmaster lifted her up to the little hole just under the office window and let her drop all the valentines into the box herself.

She was truly a happy little girl, and went to bed that night feeling as if she had already had the happiest valentine time in all her life. While she slept, however, there was much hurrying to and fro through the house getting ready for little Alice the valentine she had wished for most all her life—but she heard nothing.

The next morning the sun was shining in on her bed before Alice was awake, and when it finally did awaken her the house seemed so still she wondered what could be the matter. She hurried around and dressed herself as best she could without help, then stole quietly downstairs, thinking she would surprise her father and mother. When she pushed open the dining-room door and peeped in she held her breath, then ran quickly to her father, who sat by the fire, and jumping up in his lap, cried:

"Father! does it belong to us?"

"Yes, Alice; how do you like him?" answered her father, as he picked up a little white bundle from the nurse's lap and showed Alice the tiny red face within. "He is your valentine."

Here was the very little brother she had wanted for so long!

Tears of joy were in her eyes now, and when the baby boy was laid in her lap she said:

"This is the happiest Valentine Day I have ever had."

ANNE ELIZABETH ALLEN.

Valentines

No. 1. Two pieces of water-color paper 4x5 inches, cut into pansy shape and tied together. The lower one has a picture in the center, and is touched around the edges with gold paint. The upper one is painted as a pansy, and the petals are divided by gilt lines.

No. 2. Water-color paper 8x4 inches, cut into heart shape, so that one heart divides down the center to fold over the other one, on which is pasted a picture. Both hearts are gilded round the edges.

No. 3. Water-color paper 7x4 inches, folded as a screen, with a fruit picture on each side, and the folds and edges (with the exception of the lower one) gilded.

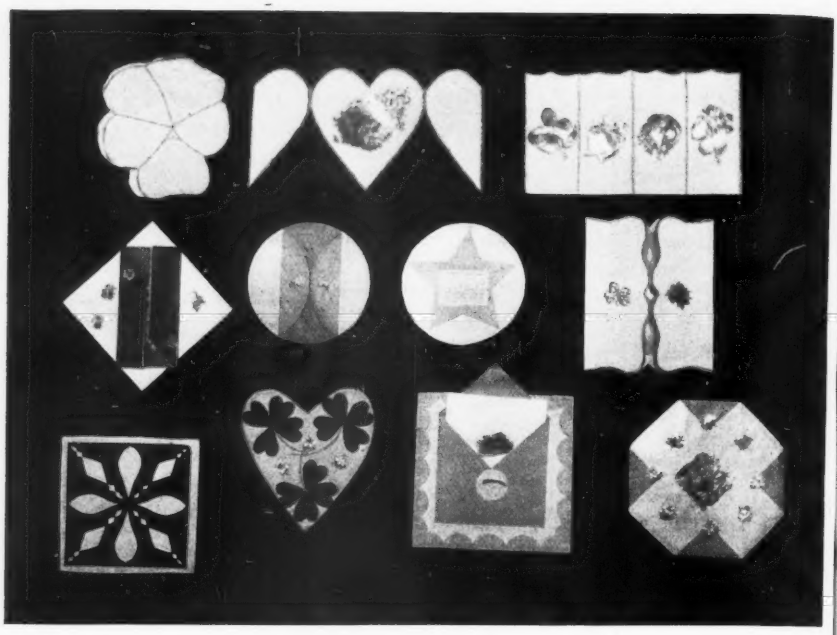
No. 4. Square of white bristol-board 4x4; red and green 4-inch squares of paper with two edges folded to center over a picture. The corners of the folds are turned back and fastened by tiny flowers.

No. 5. Four-inch circle of heavy paper or light bristol-board covered with circle of blue paper. Mounted on this are circles of orange and yellow paper, the opposite sides folded together to the center over a picture.

No. 6. Light gray 4-inch circle pasted on another circle of heavy paper or light bristol-board. On this is mounted a five-pointed star of blue paper with a calendar pasted in the center.

No. 7. Water-color paper 8x5, scalloped and folded as shown. The folds are gilded round the edge and fold over a square of pink paper cut in design and mounted flat on the white paper.

No. 8. A 4-inch square of red paper folded



SUGGESTIONS FOR VALENTINES

on itself three times, cut in design while folded, and mounted on white bristol-board 4¼x4¼.

No. 9. Bristol-board 4x5 inches, cut into heart shape, with three large flowers and three small ones pasted on it. The petals of the larger ones are made of hearts, and the stems are done with gilt paint (white bristol-board and red hearts).

No. 10. Square of gray bristol-board 5x5 with purple half-circles around edges, and mounted on it a purple square folded into shape of envelope, with picture on a card inside.

No. 11. Five-inch squares of pink, blue, and gray paper, folded so that the corners of the blue and gray papers folded together alternate with the pink. MARY HOWELL.

First and Second Grades

Harriet T. B. Atwood

History: Study of the Eskimo. The study of our February landscape will be the starting-point for the history of this month. The children realize that winter has some influence upon their own manner of living; i. e., kind of clothing worn, heating of houses, kinds of food, games, and sports, etc. The influence of environment can, however, be felt by the children much more keenly at this time in the study of a primitive people, who actually live in winter conditions during the far greater portion of the year. A great advantage is offered for the study of the Eskimo in the excellent collection exhibited at the Field Columbian Museum. The work will be taken up as follows:

I. Constructive study of Arctic landscape.

Arctic scenes will be drawn by the children upon the blackboard. The images which the children have of an Arctic scene will of course at first be largely based upon their images of our winter landscape, and the pictures which the children draw will thus contain many inaccuracies. By degrees, through the study of many pictures, descriptions given by the teacher, and simple descriptions which the children can read for themselves, many of these inaccuracies will be eliminated. Two large backgrounds will then be drawn upon the blackboard by the children, one showing winter conditions and the other summer conditions in the Arctic regions. The plants, birds, animals, etc., will be pictured by means of paper-cutting, painting, and drawing, and these will be added to the landscape.

II. Study of people who might be living in in such conditions.

1. What kind of houses would you expect to see in winter? In summer? What clothes would the people have? What food could they find? What kinds of tools and weapons could they make? How could they travel? What would they do in winter? In summer? What would be the games and sports of the children?

III. Trip to Field Columbian Museum to see how the people really did live.

1. What changes have come about among those Eskimo who have come in contact with peoples from the southern countries? What things have we which would help the Eskimo to live more happily in their cold country? What things have the Eskimo which are of value to us? What is the relative value of fur, wood, iron, etc.? Reasons.

Literature: A. E. Allen, *Story of St. Valentine; The North Story of How the Robin Got his Red Breast; The Secret of Fire*, Cooke's *Nature Myths; The White Seal*, Rudyard Kipling; *Mudjekeewis and Mishe-Mokwa*, and *Story of Kabibonokka*, Longfellow's *Hiawatha; Northern Legend of Jack and Jill.*

Speech, Oral Reading, and Dramatic Art: I. Phonic games and training in hearing and reproducing sounds, paying special attention to the opening of the mouth and sending out of tone. 1. Dramatization of portions of the *Story of Kabibonokka*. 2. The children are studying and expressing through drawing the real life of Eskimo men, women, and children as they are engaged in their various occupations; and the most natural thing, and the most helpful to the drawing, will be for them to act out in their own bodies these scenes; as, for example: The Eskimo riding on his sled, driving his dogs, and handling his long whip; the hurling of the spear and harpoon from a boat; and the children's games, such as sliding down hill and playing spearing.

II. Poems: *Far Away in the Northland*, Alice Cary, and *Valentine's Day*, will be studied and recited.

Geography: Study of our winter landscape. Study of the Arctic landscape in summer and in winter by means of many pictures and stereopticon views. Experiments to show manner in which ice cakes of various shapes float in water, packing of snow to form ice. Observation of ice packs along shore of Lake Michigan, and drifting of snow by wind. Comparison of snow after fresh snow-fall with the granular snow which has lain on the ground for some time.

Art: Decoration of valentines; painting of February landscape from windows of Academy of Science building; illustration of Northern landscape on gray paper by means of chalk; drawing of implements used by the Eskimo; drawing of Eskimo men, women, and children engaged in their various occupations, games, and sports; modeling of animals found in the far North, as the reindeer, polar bear, Eskimo dog, seal, walrus, etc.

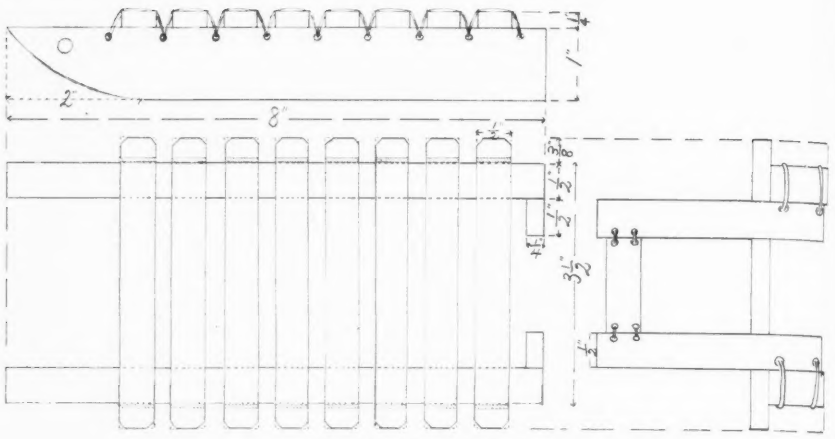
Industrial Art: Dressing of Eskimo doll in skins; making of harness for dogs.

Nature Study: I. Study of foods. 1. List of foods eaten every day. Record of food each child likes best. 2. Sources of food, whether plant or animal. 3. Uses of food. 4. Constituents of foods. Test for starch with iodine. Need of mastication of starchy foods. Test for albumen by heating. Test for carbon by burning. Test for fat. 5. Making of bill of fare for each child in winter; in summer. 6. Making of bill of fare for Eskimo child.

II. Study of birds which are winter residents of Lincoln Park. Visit to Academy of Science to study stuffed specimens.

III. Study of winter condition of trees and shrubs. Experiment to prove presence in the frozen ground of seeds capable of germination, by bringing some of the earth indoors and keeping it warm and moist.

Music: (MISS GOODRICH.) The work of these grades advances in the general direction already indicated. The growth in expressiveness is due chiefly to the individual singing which has been found to be the economical means of securing good



ESKIMO DOG SLEDGE

Made of wood. Slats and back lashed to runners by thongs of skins.

class-singing. The mechanical telling over a tune with others in the accustomed way must be avoided. After a child has expressed his idea of the song clearly—the pictures he sees in it, and the feelings it gives him—his tone and delivery have life, and these are preserved with some care, though he gives up something of his freedom when he sings the song accurately with others.

The effort to make guests or new pupils understand and like a song has been the sole means by which greater clearness of enunciation has been reached. Vividness of declamation—that is, clearly enunciated, life-like speech in singing—comes chiefly under the stimulus of this kind of motive.

Songs: *The Happy Eskimo*, *The Little Trolls*, Modern Music Series, Primer; *Flag Song*, February COURSE OF STUDY; *Flag Song*, *Sleepy Head*, Modern Music Series, First Book; *My Mother's Eyes*, *Sleep*, *Dolly*, *Sleep*, Reinecke, Fifty Songs for Children; *Sleeping Beauty*, Brahms' Nursery Rhymes (Augener Edition); *Valentine Song*.

Reading: Simple printed descriptions of animals found in the Arctic regions. Reading lessons on the Eskimo, and on foods, from Cook County Normal School reading slips. Text of songs written upon the blackboard. Reading lesson on the Eskimo in February COURSE OF STUDY.

Additional reading lessons for Second Grade: *The Snowflake's Story*, Bass Nature Reader; *The Seal*, Harper's Second Reader; *Story of Agoonack*, Jane Andrews; Selections from *The Moose, the Elk, and the Deer*, St. Nicholas, vol. 22, part 2; *A Wonderful Monster*, St. Nicholas, vol. 21, part 2; *Jack Frost*, Cyr's First Reader.

Writing, Spelling, and English: Placing of names of foods, of Arctic animals, of articles used by Eskimo, and all new words learned in dictionaries. Placing of recipes in cook-books. Writing of dimensions on all working drawings. Writing of results of experiments upon the blackboard.

Correlated Number: Use of circle maker. Planning of page for February calendar, to be used as a valentine. Reckoning of days in week and weeks in month necessary in planning calendar. Making of working drawing for envelopes to hold valentines.

School Economics: Study of milk, butter, fats. (See Miss Cooke's outline for February.)

Manual Training: Finishing of mineral boxes and making of Eskimo sledge. Making of dish-towel rack for the lunch-room.

Physical Training: Apparatus: Study of hurdling. Starting with one bar, and using but one until form of movement is well learned. In February the children begin the use of two

hurdles. The floor must be marked to get right distance for steps between hurdles.

Free Gymnastics: Form and leg movements with music.

Games: Catch ball, bean bags in a circle, circle ball.

References: Mrs. Peary's *Journal;* Rice, *Outline of History and Literature;* Schwatka, *Children of the Cold;* Kipling, *Jungle Book;* Heilprin, *Distribution of Animals;* Nansen, *The First Crossing of Greenland* and *Farthest North;* Wright, *Greenland's Ice Fields and Life in the North Atlantic; The Search for Franklin;* Baldwin, *The Search for the North Pole;* Martin, *Human Body;* Jackman, *Nature Study and Related Subjects,* pp. 80-85; Richards, *Chemistry of Cooking;* Cooke, *Nature Myths;* Longfellow, *Hiawatha;* Jane Andrews, *Seven Little Sisters* and *Each and All.*

Third and Fourth Grades

Gertrude Van Hoesen

Geography for the Third Grade: In the work planned for January it is only possible to make excursions to the different places that will represent the food supply of the city. They will only be able to get some idea of the immense amount of food shipped into the city.

The work for February will consist of a study of the sources of all of these supplies by means of stereopticon views, pictures, and descriptions.

I. Fruit.

1. The orange and lemon groves of Florida and California. How are these fruits prepared for shipping?

2. Where are the grape-fruit and tangerine found?

3. The banana groves; pine-apple fields; date and cocoanut palms; olive and fig orchards.

II. Vegetables and grains.

1. The large market gardens near Chicago.

2. Those of California owned by the Chinese.

3. The large farms of Illinois.

III. Animals.

1. The large stock farms of the West, with its typical life.

2. The life of the hunter who captures and ships the game.

IV. Means of transporting these things into the city.

The children will be given some idea of Chicago as a railroad center by drawing into a large picture the railroads which bring the food from the different sources.

Geography for the Fourth Grade: During January the children are studying Lake Michigan in its relation to the life of a great city. In February, by means of the stereopticon, pictures, and written and oral descriptions, they will be taken out of their environment to the life of the ocean, and be led to see that the only difference lies in the fact that the water is salt, thereby producing a different animal life and influencing the industries to some extent.

By means of the stereopticon, views of many coasts will be shown, and the following points considered:

I. The life of the people.

1. Their homes.

2. Their occupations.

II. What has been done to protect the lives and industries of these people?

1. Lighthouses.

2. Fog-horns.

3. Buoys.

4. Life-saving stations.

Stories of the bravery exhibited by these men during the storms along the coast. One of these stories will be adapted from a scene in *A Singular Life.*

III. Animal life will be especially studied.

1. Fish.

2. Oysters.

3. Lobsters, etc.

4. Sponges.

5. Polyps. (a) Coral. (b) Sea-anemone.

6. Star-fish, sea-urchins, sea-cucumbers.

IV. What is the difference between the water of Lake Michigan and that of the ocean? Cause?

Science: Continue work on food, temperature, and prehension of food. Special subject, air; point, ventilation.

I. Prove the presence of air.

1. Experiment: Invert a glass over a pan of water, and press down on the surface of the water. Why does not the water go up into the glass?

II. Prove necessity to fire.

III. Prove necessity to plants.

IV. Prove necessity to us.

1. Take the chest measurement of each child, both in natural and expanded conditions. To what does one inch in expansion correspond in terms of capacity or volume?

a. Experiments: Take a bottle of known capacity, place a U-shaped glass tube, one end reaching to the bottom of the bottle, the other fitted into a rubber tube, which may be placed in the mouth. Fill the bottle fitted as described with water, and invert it in a pan of water. Exhale. What happens? What amount of air was exhaled? In order to answer, measure the amount of water left — in pints, quarts, etc. In how many exhalations can a bottle be emptied?

b. Invert the bottle filled with air in a pan of water. Inhale. What happens? What is the amount of air inhaled? In how many inhalations can you fill the bottle?

c. After giving each child an opportunity to become familiar with the apparatus, make a record of each child's lung capacity. What is the lung capacity of the class? How much does the class exhale in one exhalation? Do we inhale and exhale the same thing?

d. Have one of the children blow into a jar several times. Then plunge a lighted taper into it. Note result.

e. Have a child exhale into a test tube containing lime-water. Note result. If a fire will not burn in what we exhale, what will be the effect if we inhale it? How can we be sure that we do not inhale it?

f. Place lime-water in an open vessel in various parts of the room, near the ceiling and on the floor. In what way can we be sure of getting pure air? Open the window slightly at the top and bottom. Test the direction of draught with lighted candle or smoke. What would result if the windows were left open in this way?

Have the children work out the best way to ventilate the room.

Number: I. Number involved in the study of air.

1. Amount of air inhaled by each person.

2. Total amount inhaled by the class. Average amount.

3. Total amount exhaled by class. Average amount.

II. Physical measurements of children.

1. Average height of the class. Of the boys. Of the girls. Of different ages.

2. Average weight of same.

3. Average age of each class.

4. Average chest measurement.

What has been the individual growth since October?

History: The Athenian boy. (Taken from Miss Rice's Outline.)

Story of Socrates, setting forth the poor house in which he was born, together with its surroundings—the potter's shop across the street; the sandal-maker's shop near it; the ceremonies at Socrates' birth; how the boy amused himself at home; the work at school and at the gymnasium. The appearance of the street through which he walked to school; his walk to Piræus one day to see the ships; his trials in learning to be a sculptor; what he saw when he was one day sent to the market-place; how he saw the building of the Parthenon.

The real success of the work depends upon giving the children the Greek feeling, in making them feel at home in Athens. In order to do this, it will be necessary to make them see the city and the country around it—mountains, rivers, seas, trees, flowers, animals, buildings, and people. They must do as many as they can of the things the Greeks did; e. g., play Greek games, mold Greek vases in clay, write on wax tablets made by covering thin boards with paraffine.

An excursion to the Greek room in the Art Institute will prove of great value. Pictures, models, or actual objects must

be used at all times—pictures of Greek houses, the fac-simile of Greek vases, and the Greek dress, for which the children will make designs and borders.

Music: (Miss Goodrich.) These two grades contain two different elements—one musical and independent, the other unmusical and self-conscious, with a tendency to scorn songs simple and childlike enough to connect with the work they are doing in other departments. The songs will be chosen for these older and less musical children, and for the present the emotional side will be left subordinate and the technical emphasized. As many as possible of those used in morning exercises will be learned, in which the Third Grade will grasp the tune easily, and the Fourth will understand and remember the words best. The two grades sing for each other at every lesson; the less self-conscious children are called upon for individual work, and it is hoped that the usefulness and naturalness of singing alone will presently be established generally.

Songs: *Flag Song*, February Course of Study; *Hail, Columbia*, Modern Music Series, Second and Third Books; *Le Rat de Ville, et le Rat des Champs*, February Course of Study; *Fatherland's Psalm*, Grieg (Augener & Co., Seven Children's Songs); *In February*, Songs of Life and Nature. Other songs more generally suitable for these grades: *Sleepy Head, The Snow Man*, Modern Music Series, First Book; *Hurrah for the Flag, Song of Labor, The Snow Man*, Modern Music Series, Second Book. The patriotic and other songs which require power and breadth are of course sung, so to speak, in miniature.

School Economics: (See Miss Cooke's Outline.)

Textile Fabrics: The children will design and make aprons to be worn when cooking and weave holders to be used in moving hot vessels. They will decorate the Greek dresses with embroidered designs.

Art: Modeling in clay Greek vases, decorated by Greek design, or scenes in Greek life, as the boys playing with the discus; the sea animals. Illustration in painting of scenes from Greek life and of the myths that the children of that nation were told; the pictures of the life on the coast; the surrounding landscape and the great food areas.

French: It is entirely correlated with the nature study, manual training, textile fabrics, and literature. The French literature for the month will consist of French fairy stories.

Literature: *Greek Stories*, Baldwin. The stories that the Greek children were told, as *Arachne* and *Prometheus*, especially those which emphasized the qualities which they as a people wished to impress upon the children.

Dramatic Art: In connection with the life of Socrates as a type of the Athenian boy, the dominant characteristics of the gods will be considered, and their influence upon the life of the people, as, for example, the influence of Minerva on weaving and spinning as illustrated by the story of *Arachne*, told by Baldwin in *Old Greek Stories*. This story will be dramatized. The story will be read to the children. They will suggest the action and let the action suggest the words until a little drama is the result.

Among other Greek stories used, *Prometheus* illustrates the characteristics of Jupiter. The children will read them whenever it is possible,

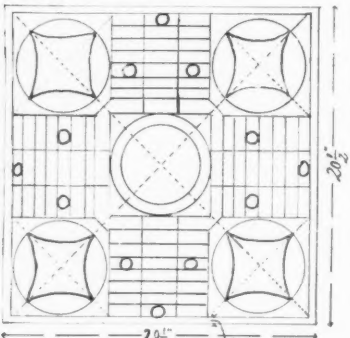
Manual Training: In January the children chose to make a set of games for the play-room. They selected the games they wished to make, which were parchesi, crokinole, conette, ring toss, parlor quoits, board and hooks, and checkers. They then decided on the number of each, and the room was divided into committees in order to make and present plans from which to work, each committee having charge of one game. Each child planned the game, and submitted it to the committee, and then the plan to be followed was selected. The plans in this Course of Study were traced directly from those made by the children. The scales below the drawings indicate the scale used by the children, not the one used in this book.

In most cases the plan was made full size on the board, and then reduced to the ½-inch, or ¼-inch, or ⅛-inch to an inch in order to put it on the paper that the children use for all of their work. Rulers, pencils, and dividers were the only tools used in making the plans.

The work was divided among twenty children, all working at one time, and was therefore perfectly individual, and at no time dictated.

The amount of number involved for the individual child may be illustrated by means of the game parchesi.

Parchesi

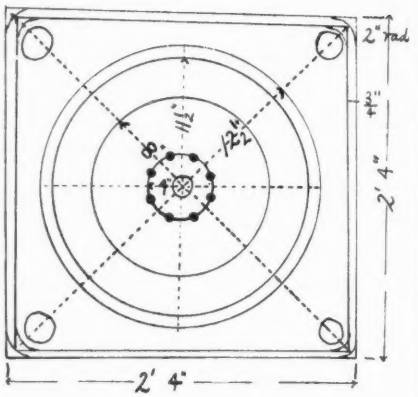


The full-sized plan required the most careful measurement and judgment. It was not drawn on the blackboard, but on a large sheet of manila paper. The foundation of the game is a piece of wood 20½ inches square, with a half-inch bevel. In order to reduce it to the scale indicated, the following were some of the problems:

¼ of 20½ inches = 5⅛ inches.
¼ of ½ inch = ⅛ inch.
¼ of 5¼ inches = $1\frac{5}{8}$ inches.
¼ of ¾ inch = $\frac{3}{16}$ inch.

and others of the same kind.

Crokinole Board.



Scale ⅛" = 1"

Filmer Coy
Emmons Blaine

The crokinole board consists of ten pieces, the foundation of which is a large piece of wood 2 feet 4 inches square. The large circle indicates a large circular piece of dark wood, which is fastened on the square. The other circles merely indicate circles on this dark circular piece of wood. The corner circles represent pockets of coarse net.

The number necessary in drawing the plan to the scale indicated was:

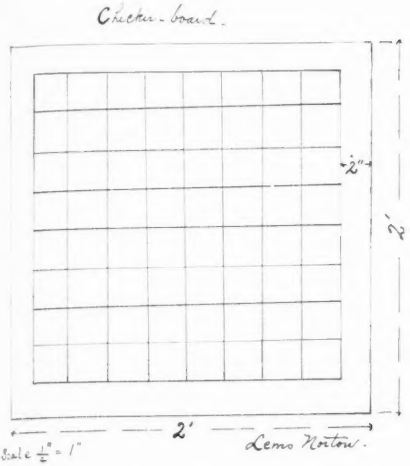
⅛ of 2 feet 4 inches = 3½ inches.
⅛ of 12½ inches = $1\frac{9}{16}$ inches.
⅛ of 11½ inch = $1\frac{7}{16}$ inches.
⅛ of 4 inches = ½ inch.
⅛ of ¾ inch = $\frac{3}{32}$ inch.
⅛ of 2 inches = ¼ inch.

The problem in planning the checker-board was different from the two preceding ones, as there was no checker-board for a model. The plan as it now stands represents a board two feet square. The children at work after several trials decided upon a two-inch border. The problem then was, how to put eight rows of eight squares in the remaining space which was twenty inches square.

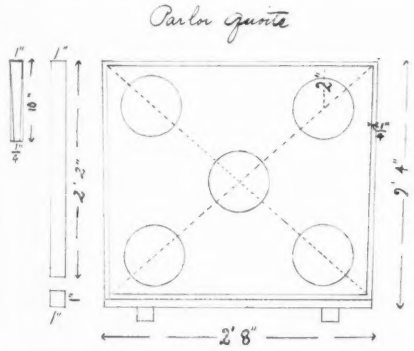
Also:

¼ of 2 feet = 6 inches.

¼ of 2½ inches = 5/8 inch.

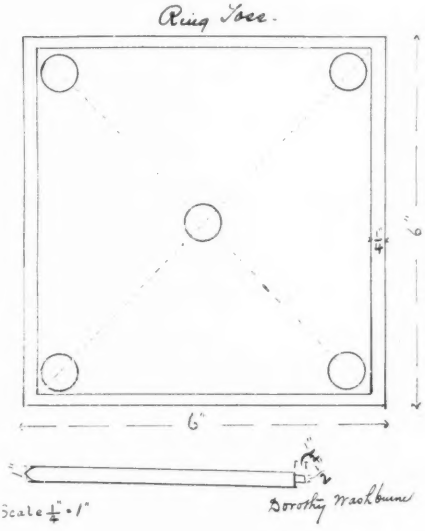


The game of parlor quoits or bean-bag is a familiar one, but the plan as presented is original. It consists of five pieces, a large rectangular board with a quarter-inch bevel,

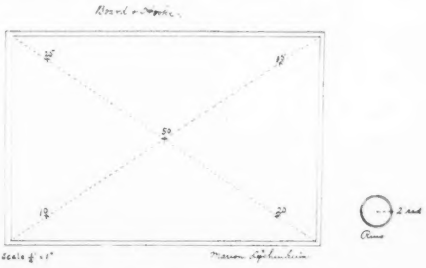


two strips which brace it at the back, and two legs which are fastened to one of the braces by means of hinges. The holes through which the bean-bags are thrown have different values, which were omitted on the drawing—twenty-five for the central hole; five, ten, fifteen, and twenty for the remaining holes. The number involved will be apparent if the dimensions and scale are noted.

The game of ring toss consists of a standard two feet square with a half-inch bevel, five upright posts, the center one being one and a half feet tall, and the others one foot, and five rings four inches in their inner diameter. The rings will be made under the direction of the teacher of textile fabrics.

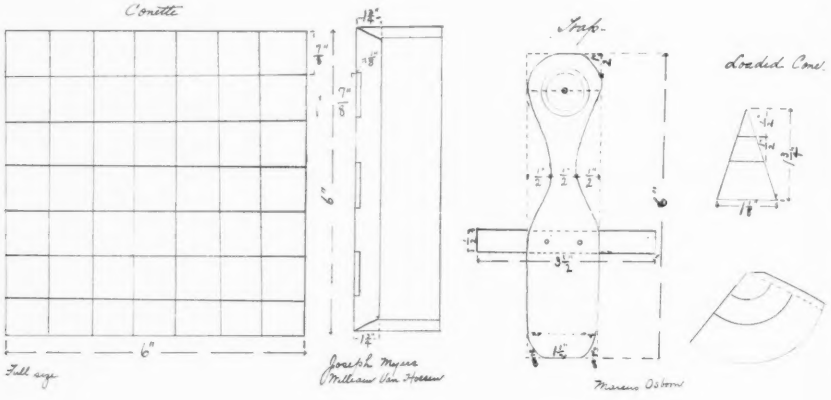


The principle of this game and that of ring toss is the same with one exception. At the points indicated large hooks are placed. The board is then placed in a vertical position. In ring toss the po-



sition is horizontal; but in both cases it consists of throwing the five rings so dexterously as to place one on each hook or pole.

Conette consists in a box six inches square and one and three-fourths inches high, two traps, and a cylinder of loaded cones. The plan presents a view of the box as seen from above and one side of the box. Across the top of the box cords are strung at right angles with each other, so as to make a net. The most ingenious piece of work done in all the work with the games was probably the planning of the trap by a boy who is very averse to number but deeply interested in all constructive work. The trap was given to him with directions to show how to make one. The plan as shown here is what he produced at the end of one-half hour. The game of conette is one which was gotten out by the Milton Bradley Company.



Fifth Grade

Clara Isabel Mitchell

The kinds of hand-work planned for the month are cooking, weaving, clay-modeling, and wood-sloyd.

Cooking: In January the class began the cooking and study of cereals. The first lesson was the comparison of familiar cereals—wheat, corn, oats, barley, and rye; the popping of corn, weighing before and after popping; and making of popcorn balls. The second began with an examination of the corn food—corn meal, fine and coarse, hominy and corn-starch, followed by the making of corn-starch mold. The third was washing the starch out of wheat, boiling it and using. The fourth was the roasting of wheat and oats for cereal coffee, making the coffee; also of postum cereal.

Continuing the study of cereals in February, the children cook oats, corn, and wheat, comparing them with potato as another starch food. The first lesson will be the cooking of oatmeal and wheat germ by the following rule (Mrs. Alice P. Norton's):

(All measurements are made level.)

WHEAT GERM WITH DATES.

2 tablespoons of wheat germ.	⅛ teaspoon of salt.
½ cup boiling water.	4 dates, or
	4 stewed prunes.

Sprinkle the wheat germ into rapidly boiling salted water, stirring rapidly. Boil for two minutes, then place the saucepan in another of boiling water, and continue the cooking for twenty minutes. Meanwhile remove the stones from the dates and cut them into small pieces. Stir them into the wheat germ just before serving. Cooked prunes may be used in place of the dates.

OATMEAL WITH FRUIT.

4 tablespoons rolled oats (steam cooked).
½ cup of water.
⅛ teaspoon of salt.
1 apple cooked in a syrup made from 1 tablespoon of sugar and ¼ cup of water.

Cook the oatmeal in water as directed for wheat germ, but extend the time to thirty minutes. Core, pare, and cook the apple. When it is soft, remove it from the syrup, place in a saucer, fill the cavity with the cooked oatmeal, and pile the rest of the oatmeal around it.

The second lesson will be an excursion to a flour-mill; the third, cooking of potato.

POTATO SOUP.

1 small potato.
1 cup milk.
1 small slice of onion. (This may be omitted.)
½ tablespoon butter.
½ tablespoon of flour.
¼ teaspoon of salt.
Speck of pepper.
¼ teaspoon chopped parsley.

Boil the potato till soft and mash thoroughly, using a potato ricer, if possible. Scald the milk with the onion, and remove onion. Make a thin white sauce as follows: Melt the butter, add the flour, salt, and pepper, mixed together; then the milk slowly, stirring constantly. Cook for two minutes, add to the potato, strain, stir in lightly the finely chopped parsley, and serve. If too thick, dilute with a little hot milk.

The principle of all vegetable soups is that of a white sauce diluted, with the addition of a vegetable. The flour is necessary even with the starchy vegetable, to "bind" the soup.

The fourth lesson will be the boiling of sugar to barley candy. In the course of the lessons children's attention will be called to the sweet taste of starch after mastication; different kinds of sugar will be shown them, and comparisons made between milk sugar, grape, beet, glucose, and cane; also between loaf sugar, granulated, confectioner's, powdered, and brown.

Weaving: Work on the cushion covers commenced in January will be continued. The apparatus, material, and plan for these are described in last month's COURSE OF STUDY, under "Textiles." To contrast with this primitive weaving, the large modern loom will be used in making a coarse cotton or linen fabric, such as was made by the New England colonists. If the curtain for the book-shelves, already begun, prove successful, it will be ornamented with original designs worked out in coarse wools.

Wood-work: After the use of the primitive and modern looms, and an excursion to the factory of the Mansure Company, Lake Street and Michigan Avenue, an attempt will be made to have the children invent and make a loom of their own, one large enough to weave fabrics of a yard in width.

Nature Study: (WILLARD STREETER BASS.) METEOROLOGY. The weather record by means of the color chart and graphical thermometer record will be continued this month.

ASTRONOMY. The sun's slant will be observed with the skiameter, and the area of level ground covered by a beam of sunshine of given cross-section determined and compared with that of previous months. At the same time the average temperatures of the months will be compared.

FOODS. The study of the common grains begun last month will be continued. Wheat will at first receive special attention. The class will study a single kernel, make transverse and longitudinal cuttings, and examine the sections with a hand lens. The use of the four concentric layers thus seen will be discussed. The class will then visit a flour-mill and watch the manner in which the various parts of the kernel are separated from each other and find the kind of flour which is obtained from each.

The children already know that starch occurs in flour, and is what makes the flour useful in making paste. They will now learn to recognize starch by the iodine test, and will examine all the grains for starch. They will also test other foods, such as potatoes, bananas, etc., for starch.

The class will determine by testing what articles of food contain sugar, and will find by comparison with the results of the above work whether these foods are the ones which also contain starch. The change of starch into sugar will be observed by chewing a starchy food for a long time and noting the change in its taste.

History: The history lessons will begin a comparison of the industries of the aboriginal Americans, contrasting their conditions with those of the early colonists. It is hoped that the view of these primitive beginnings may help the children to a better understanding of industries of our own time.

Children of the Fifth Grade are expected to know something about the history of the aboriginal tribes, and in addition to that to have been set thinking about the colonial life in early Massachusetts, Virginia, and New York. It is probable, however, that these particular children have not had work in the study of the aborigines, and therefore preparation will be made to teach it for the first time.

Beginning with Indian life, the method, in detail, will be:

1. Getting at the children's own experience in and knowledge of plains and mountains through oral and written expression or by means of drawings.

2. With pictures, stereopticon views, and descriptions bringing about clearer imaging of plains and forests as the homes of people.

3. Picturing in detail the Appalachian region, the St. Lawrence and Great Lake region, and the Mississippi Valley, giving temperature and prevailing winds, to let the children reason as far as they are able the habits and customs of savages native to each region.

4. Visiting museums, studying of pictures, and reading with the motive of learning more about the ways in which these early peoples found their food, obtained or made their clothing, and built their dwellings and defenses. Beyond this the study of Indian art and myth will give some sense of the Indian's thought about his own life and of his feeling toward nature.

Taking the Iroquois tribe as a type of the hunter Indian, the following points must be made clear in the development of the subject:

1. Effect of abundant game as food supply.
2. Lack of animals which could be domesticated.
3. Forest as affording protection and building material.
4. Importance of Indian corn.
5. Lack of incentive to the invention of tools other than the chipped or polished stone.
6. Plan of the Long-house explained by the needs of communal life.
7. Necessity for organization of tribes and clans; sachem, chief, and council; union of tribes.
8. Domestic life. Division of labor, primitive industries of building, horticulture, pottery, sewing and decoration of skins, making of stone implements, basket-weaving; all the natural consequence of environment.
9. Openness of the Mississippi Valley region as accounting for the building of mounds.
10. Same cause as explaining impossibility of advance in culture; lack of protecting mountain walls, which would have afforded opportunity for cultivating the arts of peace.

The life and customs of the Pueblos and Cliff Dwellers can be understood only through study of the geographical regions in which they were found. Some knowledge of the mountains of Arizona, Mexico, New Mexico, and Central America can be given through pictures, and this will be the basis of the children's reasoning for themselves the probable character, habits, and culture of the peoples. The method in this work will be the same as suggested above in connection with the study of the Iroquois, the following points being considered:

1. Structure of the Mandan house, as suggesting Pueblos.

2. Migration of northern tribes to the south and southwest.

3. Settlement in protected mountain places.

4. Necessity for irrigation involving change to agricultural habits.

5. Availability of clay as building material.

6. Evolution from sun-baked brick to rubble-stone and coral lime blocks.

7. Necessity for mutual protection expressed in the plan of the Pueblo village.

8. Greater protection of the Pueblos enabled them to progress further than other Indians in the science of government, in arts, and in the industries. Powers of government vested in (1) clan council; (2) sachem; (3) war chief. Differentiation in functions of offices — priests', tax-gatherers', speakers'.

9. Standards in domestic life higher than among Indians of the Iroquois type. Inheritance in the male line. Marriage laws.

Geography: The geography study will be planned to explain as much as possible of the history. That the children may get the conception of the continent of North America as the home of people, a powerful influence in shaping human life, they must be able to image something of its great masses of lowland and highland, and their relation to each other; the river systems, which explain so much of its building and wearing; soil, climate, winds, and animal and vegetable life.

Preparatory to direct work on the modeling of the relief map, it seems wise to make sure that the children have images of those elements which give life to the map. For that reason study and modeling of the continent have been preceded by pictures and stereopticon views of mountains, plains, plateaus, valleys, rivers, river-basins, forests, meadows, deserts, volcanoes, glaciers, and scenes of sea-action. Excursions to Lakeside and the sand dunes have taught the children the fundamental facts of the lake's wearing and building. This, with their experience at the seaside, and the pictures of coasts, can be built into the conception of the work done by the oceans in building and wearing the continent. Study of a few important rocks has given them a basis upon which to build their images of mountains — quartz, granite, gneiss, shale, mica, sandstone, and limestone, all of which they have tested by scratching and treating with acid.

Excursions to the lake-shore, to swamps, and to a farm have given opportunities for the study of soils, so the children know the story of the making of sand, vegetable mold, and garden loam. In the laboratory they have watched the workings of an artificial river, and have gained through that a notion of its wearing and building. Apparatus for illustrating rise and fall of a continent also is in process of construction in the laboratory.

In connection with the stereopticon views the children have been told the stories of the probable formation of the rocks, and the theories of the uplifting, folding, and volcanic eruption of mountains. With this as a basis, it is hoped that they may begin to image the continent as a background for the human life upon it.

The Indians, Cliff Dwellers, Pueblos, Eskimos, and early colonists will be pictured in their geographical positions, and the geography will be studied as explanatory of their characters and habits. The map of the whole continent will at first be modeled and drawn without much detail.

After the relations of the great highland masses, slopes, and plains have become sufficiently clear, the Mississippi Valley will be studied as the home of the Indians; the Appalachian and St. Lawrence region also as their home; the great western highlands as affecting winds and rainfall, and as affording protection to Cliff Dwellers and Pueblos.

Arithmetic: Arithmetic will be taught in measuring the effect of heat in evaporation of water. Evaporation, condensation, and precipitation of moisture will be studied in laboratory experiments, as re-

lating to the questions of rainfall, distribution of moisture, and air movement; and as explaining primarily the existence of our great American forest and desert regions.

The introduction to this work will be the summing up of the children's observation as to causes of evaporation, cloud formation, rainfall, snow, hail, frost, and dew.

As helps to imaging conditions of these phenomena the following experiments will be made and discussed:

1. One gallon of water in a shallow wide vessel will stand for twenty-four hours in a place of low temperature. An equal amount of water in an exactly similar vessel will stand for the same length of time in a place of high temperature.
2. Same experiments will be made with deep, narrow vessels.
3. The same, again, will be performed with the quantity of water changed to 100 cubic centimeters.
4. Exactly similar experiments will be made, changing one condition—that of air movement. One set of shallow and deep vessels of water containing one gallon, or 100 cubic centimeters of water, will stand in a place of quiet; another set of equal quantities and proportion will be placed under a strong draught of air.

To understand the meaning of the experiments, the children must see and measure in each pair of experiments (a) in which case evaporation was greatest in volume; (b) how much greater; (c) what part of the volume of each evaporated; (d) what per cent of each volume evaporated; (e) difference in per cents.

Arithmetical processes will be taught at points where they are needed, and are not understood. After conclusions have been reached on the basis of results obtained in the experiments, the class will be asked to estimate amounts of evaporation of larger bodies of water varying in area.

It is hoped that these lessons will help children to image the larger work done by heat and air currents in distributing moisture over the surface of our continent.

Literature: As a means of getting more clearly at the standpoint of the people studied, we shall read as much as possible of their own thought as expressed in their literature. The truest translations available will be given to the children, and specimens of picture-writing shown at the same time.

Dramatic Expression: Certain parts of the literature read this month are considered sufficiently good from the literary and dramatic standpoint to bear the study necessary for oral expression. Some of these portions will be committed to memory, recited, and possibly dramatized. The bits selected are from Mrs. Ellen Russell Emerson's *Indian Myths*, and from original verses in *Reports of the Bureau of Ethnology*.

Reading: The children will read from *Stories of Industry* (Vol. II, pp. 82–99); selections from *Ethnological Reports*, IV and V; *Our Continent*, Shaler; Tarr and McMurry's Geography, *North America;* and opening chapters of *The Story of the Thirteen Colonies*, Guerke.

Writing: There will be ten minutes' daily practice in pen-movement; fifteen minutes each day will be spent in rapid writing of reports of laboratory work or cooking; conclusion of discussions, or personal experience or opinion on points of lessons.

Excursions: Excursions are planned to visit a flour-mill, a textile factory, and the Field Columbian Museum.

Art: Fine specimens of Indian art can be found in museums, and may also be studied in pictures. It is probable that contact with these beautiful objects and enjoyment of them will help greatly toward a more intimate knowledge of the life, thought, and feeling of the peoples who made them.

The children will make drawings and

paint pictures to illustrate scenes in Indian, cliff dwelling, and Pueblo life; bits of mountains, plains, and river scenery in connection with modeling the relief map of North America; illustrations of stories and myths. Indian statuettes and heads will be modeled in clay.

Music: (See Sixth Grade outline.)

References: SCIENCE. American Kitchen Magazine (Dec. 1900, p. 93), *How Flour is Made and Branded; Stories of Industry* (v. 2, pp. 82-99).

HISTORY. Fiske, *Discoveries of North America*, v. I, Chap. 1; Bancroft, *Native Races;* Morgan, *League of the Iroquois, Ancient Society, Houses and House Life;* Cadwallader Colden, *History of the Five Nations; Smithsonian Report, 1887* (pp. 605-681); Bandelier, *Archæological Tour of Mexico;* Catlin, *North American Indians; Reports of Bureau of Ethnology*, (V, 1-5, 7-10, 13-15; V, 539-555; II, 9-45; IV, 472-521); Naidaillac, *Prehistoric America*, Chap. V; Shaler, *North American Indians;* Starr, *American Indians.*

GEOGRAPHY. Reclus, *North America;* Carpenter, *North America;* Shaler, *Story of Our Continent*, also *United States of America;* Mill, *International Geography;* Stanford, *Compendium of North America;* Russell, *Lakes of North America*, also *Rivers of North America, Volcanoes of North America;* Frye, *Geography.*

LITERATURE. Mrs. Emerson, *Indian Myths;* Brinton, *Myths of the New World*, also *American Hero Myths;* Leland, *Algonquin Legends of New England.*

German: To overcome the beginners' difficulties in reading, besides Ahn's *Primer*, picture-books, and especially books for children of this and later ages, will be used. A list of the best of these books will be given which may help to make reading interesting and easy in class and at home. Writing exercises in small letters will be continued. The grammar topics are: Formation of plural, sentences involving the first future of "sein" and "haben." Exercises in addition, subtraction, multiplication, and division will be continued after the plan given in the January number. Questions and answers relating to time: names of the months, days of the week, division of time, will serve as a beginning in the language of every-day life. The memory work for February and March is:

Walter, Wilhelm Tell's boy, sings:

Mit dem Pfeil, dem Bogen
Durch Gebirg und Thal
Kommt der Schütz gezogen
Früh am Morgenstrahl.

Wie im Reich der Lüfte
König ist der Weih —
Durch Gebirg und Klüfte
Herrscht der Schütze frei.

Ihm gehört das Weite;
Was sein Pfeil erreicht,
Das ist seine Beute,
Was da fleucht und kreucht.

Friedrich Schiller,
„Wilhelm Tell, III, 1."

Sixth Grade

Edith Foster Flint

Geography: The month's work will include a study of southwestern Asia—the region much of which Marco Polo crossed, and which embraced an important part of the old routes of trade between Europe and Asia. The children will first see it as a whole, as a table-land of the extent of Thibet, but much lower, with Arabia extending in peninsular form at its southern extremity into the Arabian Sea. They will note the waters which wash its boundaries—the Arabian Sea, the Persian Gulf, the Red Sea, the Mediterranean, the Caspian, and the Black seas, and the mountains which help to mark it off—the Suliman and Hindu Kush ranges on the east, and the

Caucasus on the north. They will note that but one important river basin appears in the region—the Tigro-Euphrates. They will compare its length (2,500 miles from east to west), its breadth (250 to 600 miles), and its elevation (2,000 to 8,000 feet), with the corresponding measurements of other countries they have been studying or are familiar with. They will model plateau and peninsula in sand and in chalk. After a conception of the region as a whole has been gained, they will proceed to study in more detail the geography of the principal political divisions.

I. ARABIA: 1. A peninsula; irregular parallelogram in form; length, 1,300 miles; greatest breadth, 1,500 miles; breadth at apex, 900 miles. (Compare with India.)

2. Geographical divisions: the coast ranges; the desert ring; the central plateau.

3. Coast-line: few harbors.

4. Climate of these regions; rainfall; drainage; salt plains.

5. Effect of climate and configuration on occupations of the people: herding; agriculture; weaving.

6. Exports: camels, sheep, hair, wool, coffee, dates, horses, pearls.

II. PERSIA: 1. A table-land dropping to the Caspian Sea for nearly one-third of its northern frontier, and to the Persian Gulf for its southern limit; mountain ranges and broad intervening plains; irregular mountain masses, with fertile valleys, basins, and ravines.

2. Geographical divisions: lowlands are the coast tracts; in the north these are wooded, and climate is damp, feverish, and relaxing; in the south, dry and barren, with hot and violent winds; the highlands are central; the salt desert of Khurásan.

3. For irrigation the plains and valleys depend on the mountains; water supply always scanty; rivers not big enough to reach the sea; consequent salt pools and lakes.

4. Herding; weaving; Persian rugs.

In the consideration of Afghanistan and Asia Minor, which form part of the Iranian plateau, the position of the two regions—the first between Russian and British territory, and the second between Europe and Asia, with its general effect on their history and peoples, will be discussed. For the rest, the nature of the peoples and their occupations will be taken up. Throughout the month the influence of climate and configuration of the land on occupation and nature of the people will be strongly emphasized.

References: Articles on *Asia*, *Afghanistan*, *Arabia*, *Armenia*, *Mesopotamia*, and *Persia*, in *Encyclopedia Britannica*. Articles on *Arabia*, *Persia*, *Afghanistan*, in *International Geography*.

Science: The work for February, like that for January, will closely correlate the science and the cooking with each other and with the geography. The plan for this month embraces a study of coffee, tea, cocoa, and milk—all products of the countries under consideration. In studying coffee, tea, and cocoa, the children will first see these articles themselves in their various stages of growth and preparation, the specimens to be obtained from the museum and from one of the large wholesale grocers. They will then be shown pictures illustrating the methods employed in the cultivation of the plants and in the preparation of them for market. In each case they will study: (a) the natural history of the plant; (b) its preparation for market; (c) the varieties and cost of the product; (d) the places where it grows; and (e) its history. The work will afford excellent opportunities for expression, both in writing and in painting.

The study of MILK will demand laboratory work in the following ways:

1. The presence and amount of water in milk to be shown by weighing the milk and then boiling off all but the solid ingredients. (Up to this point this grade has done no work with the scales.)

2. The presence of mineral matter to be shown by the burning off of all but the incombustible part of the solid residuum.

3. The presence of fat to be shown by churning.

4. The separation, by means of acid, of the curd and whey.

5. The sugar test is too complicated for the Sixth Grade, but a bottle of milk sugar will be shown in evidence of the presence of sugar in milk.

History: The subject for the month is Florence. In the study of Venice much time was spent in the consideration of Venetian achievement in architecture and art. The work for February goes a step farther in this direction, and takes up Florence, not from the historical point of view, but from that of the City Beautiful. The children will learn the story of Cimabue and of Giotto; they will study pictures of Giotto's tower and of the Brunelleschi gates. They will see pictures of the city, and will compare its aspect with that of Chicago and of other cities with which they are familiar. From all this they will derive the knowledge that in Florence art was not merely a thing to be kept carefully glazed and framed and hung on the wall in houses and galleries, but was "a thing to walk with hand in hand." This fact they will discuss and will compare with the state of affairs in modern cities, particularly in America, and will inquire into the causes of the difference. (Several of the Sixth Grade children have traveled somewhat extensively here and abroad.) They will be shown particularly pictures of statues and paintings which, though situated in public places and often out of doors, have been perfectly preserved, not harmed by the people. (Luca della Robbia's medallions on the Foundling Hospital, and the experience with the triangle of ground in Chicago taken in charge by the Women's Club, may be used as typical examples.) The story of Cimabue's Madonna and Child borne from his studio to the church in a festive procession of the people and trumpeters may serve to bring vividly home to the children's minds the attitude of even the common people in Florence toward art.

From this point something about Gothic architecture and the freedom it afforded the artisan for the display of individual powers and fancy will be introduced and contrasted with modern plans of decoration. In contradistinction to this prevailing tendency, however, the Arts and Crafts movement may be cited.

The aim of the month's work will be to build up a conception of civic beauty and to stimulate an interest in the artistic needs of our own city. The last part of the work will consist of discussions as to what means, both negative and positive, we may use to make our city beautiful.

Speech, Oral Reading, and Dramatic Art: This grade is reading this month Kipling's stories of animal life, and in the effort to be understood by the rest of the class each individual is gaining in skill, in power to think by means of the printed page, and is also beginning to feel the necessity for clear enunciation, and for speaking out.

We shall follow the study of India by a reading of the story of *The Demon of the Matted Hair*, one of the Hindu myths, and of the *Tar Baby*, by Joel Chandler Harris, noting the points of resemblance in thought and in construction.

The children will commit these stories to memory and tell them to the class.

The poems *Yussouf*, by James Russell Lowell; *Harmosan*, by Richard Chenevi French; *Abou Ben Adhem*, by Leigh Hunt, and *The Leap of Roushan Beg*, by Longfellow, will be read by the children. All these are stories of the countries in which they are especially interested this month and the one which, at the time, seems to appeal most strongly to them, will be studied for oral expression.

Music for the Fifth and Sixth Grades: These grades have begun to do some individual singing, with immediate good results. The attempt to express the thought or feeling as it appeals to them, even though

it shows no variety or power to wield the rhythm of the song, and make it bend to the text, is successful in the most important respect—it produces a more vital quality of tone. Some of the independence and self-poise needed by people of this age will be acquired in this way.

Songs: *Flag Song*, February COURSE OF STUDY; *Hurrah for the Flag*, *The Snow Man*, Modern Music Series, Second Book; *In February*, Songs of Life and Nature; *Hail, Columbia*, Modern Music Series, Second and Third Books; *Fatherland's Psalm*, Grieg; Seven Children's Songs, Augener & Co.; *The King of Love*, Songs of Life and Nature.

Painting: An hour each week will be devoted to the painting of a landscape as viewed from the windows of the Academy of Science in Lincoln Park.

Clay-modeling: As in the case of China and of India, the children, while studying Persia and Arabia, will illustrate characteristic figures and industries in clay.

Sand-modeling and Chalk-modeling: These will both be largely used in connection with the work in geography.

Number work: Much number may be taught through the geography. (See Seventh Grade outlines for January.) It may be, also, that in connection with the history the children will learn something of the geometry of design.

References: Carpenter, *Asia* and *South America* (pp. 257–267); Chisholm, *Handbook of Commercial Geography* (pp. 118–121 and 122–128); Eliot, *Romola;* Fergusson, *History of Modern Styles of Architecture* (pp. 117–125); Harvey, *Our Cruise in the Claymore;* Hawthorne, *French and Italian Notebooks* (pp. 269–432); Kirby, Elizabeth and Mary, *Aunt Martha's Corner Cupboard* (pp. 14–42 and 56–74); Meiklejohn, *New Geography* (pp. 299–322); Mill, *International Geography;* Oliphant, *Makers of Florence;* Palgrave, *Narrative of a Year's Journey through Central and Eastern Arabia:* Reclus, *Earth and Its Inhabitants* (v. 4, *Asia*, and v. 4, pp. 448–449, and 463–464); Rodenbough, *Afghanistan and the Anglo-Russian Dispute;* Stanley, *Sinai and Palestine*, Symonds, *Sketches and Studies in Italy and Greece* (v. 2, pp. 201–257); Taine, *Italy: Florence and Venice* (pp. 71–159); Wilson, *Handbook of Domestic Science and Household Arts* (pp. 98–108 and 129–141); Wing, *Milk and Its Products.*

Sixth and Eighth Grades

German: In the reading exercises, besides Ahn's *Rudiments in the German Language*, the books indicated for the Fifth Grade will also be helpful here. That the pupils may obtain some skill in German script, special exercises with this in view will be continued. Exercises in arithmetic, as given in the January number, will be continued and extended. The special subject of study in these classes for this quarter is Roman history. The pupils therefore will be given a special selection, the legendary struggle of the Horatii and Curiatii, which will serve as a sort of composition (Aufsatz), furnishing exercises in forming simple phrases, and in declension and conjugation. The memory work will be:

Das Schwert.

Zur Schmiede ging ein junger Held,
Er hat ein gutes Schwert bestellt;
Doch als er's wog in freier Hand,
Das Schwert er viel zu schwer erfand.

Der alte Schmied den Bart sich streicht:
„Das Schwert ist nicht zu schwer, noch leicht;
Zu schwach ist Euer Arm, ich mein';
Doch morgen soll geholfen sein."

„Nein, heut, bei aller Ritterschaft!
Durch meine, nicht durch Feuers Kraft."
Der Jüngling spricht's, ihn Kraft durchdringt,
Das Schwert er hoch in den Lüften schwingt.

Ludwig Uhland.

Seventh and Eighth Grades

Katharine M. Stilwell Nott William Flint

Nature Study: I. RESPIRATION: It was found advisable to teach the children something of the mechanics of respiration before taking up the subject of ventilation; so this outline should properly have come in the December number. Let the children observe the reactions of the constituents of normal air in simple laboratory experiments.

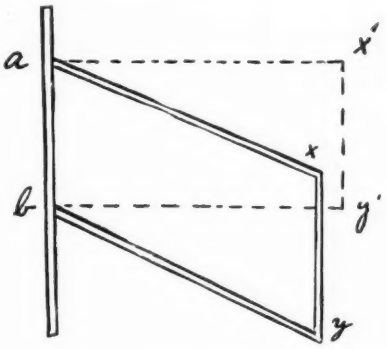
Note what happens when lighted sulphur, phosphorus, the glowing end of a match, or a red-hot bit of iron or steel spring is thrust into a jar of oxygen.

Make nitrogen before the children by burning phosphorus in a jar of air inverted over a basin of water. Perform the same experiments as with the oxygen, and have the children note results, and tell whether nitrogen or oxygen is probably the more important element to human beings. Give them the proportions of normal air: N 70%, O 20%, CO_2 .04%, and teach them the meaning of the chemical symbols.

II. ORGANS OF RESPIRATION: (Use pictures, diagrams, and apparatus as far as possible.) Mouth, nose, throat, bronchial tubes, lungs, pleura, diaphragm, ribs, and respiratory muscles. (Avoid the multiplication of scientific terms; the object is to make the child understand how we breathe.)

III. MECHANICS OF RESPIRATION. 1. The dilation of the thorax (best demonstrated by use of a skeleton) as shown by: (a) The double sloping of the ribs, so that when they are lifted in front and rotated in their sockets the chest cavity is increased in size. (b) The depression of the dome-shaped diaphragm into a cone-shaped membrane, and the consequent increase of the chest cavity at its biggest end.

2. How the lifting of the lateral walls of the chest increases the volume of the thorax may be shown diagrammatically by



the use of a simple piece of apparatus which any child can make.

The parallelogram frame *axby* is made of any convenient size, with the joints slightly loose, so that it can be moved upon the backbone *ab*. Let *ab* represent the backbone, *ax* and *ay* the ribs, and *xy* the sternum. Then *axby* would be the normal position and *ax'by'* the ribs in the extended or inflated position. Compare the areas of the two figures. Which is larger?

3. Let the children hold their hands to their sides, take a deep breath, and then tell whether there is any other than an upward movement to the ribs. The mechanism of the lateral extension should be shown on a skeleton if possible. Abnormal forms of respiration and their uses: coughing, sneezing, snoring, crying, sighing, and laughing.

Number Work: (The examples are suggestive.) 1. It appears that the body takes up in respiration 4.782% of O from the air inhaled, and gives off (about) 4.38% of CO_2. What is the ratio of CO_2 expired to O absorbed?

2. If a person breathes 30 cubic inches of air per inspiration and makes 25 inspirations a minute, how long will it take him to breathe all the air in a room 20x10x10 feet? How long will it take 15? How long will it take this class to breathe the air in the room?

3. Air containing .40% CO_2 is bad for breathing. How long will it take to spoil the air in this room if the doors and windows are shut tight? (Factors: the number of persons; the average number of inspirations, and the per cent CO_2 given off by one person.)

4. If the air is rendered injurious when .2% of CO_2 is present, how many cubic inches of air do you render impure by each respiration?

5. How many cubic feet do you render impure per hour?

References: Any good physiology; Jackman's *Nature Study*.

Geography: (In correlation with history.) I. THE CENTRAL HIGHLANDS: North of the Danube from the Carpathians to the Rhine. Note the sweeping curve of the Alps from the Gulf of Lyons to the neighborhood of Vienna. This central ridge will make a good starting-point for the teaching, for as the birthplace of Europe's mightiest rivers, as the natural barrier between her mightiest peoples, a prime factor in the distribution of its climates, and in modern times the noblest of all international playgrounds, the Alps play a large part in the economy of the continent.

SURFACE: Suppose the class to be standing upon some lofty peak of the northern Alps, and to look northward. What would the country look like? What would they see?

Irregular lines and groupings of hills rising from a central table-land intersected by deep-cut valleys of rivers. 1. Central knot, Fichtelgebirge. 2. Eastward, Erzgebirge and the Bohemian forests. 3. Farther east, Sudettes. 4. Westward, Thuringian forests and Franconian Jura, and south of these the Suabian Jura, which joins on the Black Sea. (Class will mold these highlands in sand; they should read as much as possible on this part of Europe, and see all kinds of pictures of the country and the people.)

I. RIVERS: Weser, Rhine, Elbe, Main and Neckar. With the relief map before them the class should reason out the comparative age of the rivers and the highlands.

II. The Northern Plain: Surface; formation. Coastal plain of the North Sea. Rivers.

III. Climate as dependent upon: 1. Nearness to sea. 2. Direction of prevailing wind. 3. Elevation. 4. Latitude. After studying these conditions the students will be led to infer the climate of this region.

IV. The political divisions of to-day: 1. Boundaries; shape; size, 212,000 square miles.

2. Commercial position: Chief exports and imports. Relation of these to the industries and manufactures. Upon what does the chief industry depend? Who is the chief customer?

3. The people: Social condition. The Agrarian, the Socialist, and the Imperial parties. Population, 50,000,000. What is the average density.

4. Internal improvements:

(a) Railways, 29,600 miles. (b) Telegraphs, 57,000. (c) Canals, 15,000. (d) Macadamized roads, 70,000.

5. Government: Colonial possessions — Africa. Islands of the Pacific. Extent, 1,020,680 square miles. Population, 10,650,000. What is average density. Why do Germans emigrate to America.

II. THE NETHERLANDS.

I. Position: Holland is one-fifth below the level of the sea. Area of subsidence for the most part is nothing more than the delta of the Rhine.

II. Commerce: Imports, $602,500,000. Exports, $490,000,000. Most important are the products of agriculture and stock-raising. Means of transportation, 9,500 miles of roads and dykes; 7,000 miles of tramways (mostly steam); 2,000 miles of railways.

III. Colonies: Java, 52,554 square miles. Dutch East Indies, 685,846 square miles. Dutch West Indies, 403 square miles. Dutch Guiana, 46,060 square miles. How do its position, its commerce, and its colonies affect the importance of the Netherlands?

III. Surface: (Show pictures of Holland.) Mold Netherlands in sand. How was this land made? What part has man played in its history?

IV. Rivers and canals.

V. Area: 12,728 square miles — 26% agricultural, 35% grazing, 7% forest, 20% waste. Find number of square miles of each.

VI. From latitude and position with regard to North Sea and the elevation let the children determine what the climate is.

VII. The people: Occupations. Government.

III. DENMARK.

I. Surface: West and north, moorland. Southeast and in the islands, hilly.

II. Area: 14,124 square miles. Area of peninsula, 9,752 square miles. The Faroes. Coast of Greenland. Iceland. West Indies—St. Thomas, St. John, St. Croix. (United States is trying to buy the Danish West Indies now. Why?)

III. Coast-line: 5,000 miles. What is the number of miles of coast-line to each square mile of area?

IV. Occupations of people: One-fourth are in agriculture. Crops — rye, wheat, oats, and barley. Manufactures: Porcelain.

V. People: 2,000,000. Government.

IV. RUSSIA.

I. Size and shape: Area, 2,090,000 square miles; length, 2,400 miles; width, 1,800 miles.

II. Commercial position: What is Russia's place in the commerce of the world? Ports.

III. Surface: A vast plain; tundras. North Russian lowlands. North Russian table-lands. Steppes. Caspian depression.

IV. Drainage: 1. North: Petchora, Dwina. 2. Baltic: Neva, Dura, Niemen, Vistula. 3. Black: Dniester, Dnieper, Don. 4. Caspian: Volga, Ural. Volga has 200 mouths in its delta, and is 2,230 miles long. Character of rivers.

V. Lakes.

VI. Climate: Plain open to north and south. (Effect of this?)

VII. Black lands: Between Carpathians and Urals, 240,000,000 acres.

VIII. Industries: 1. Agriculture: Wheat, maize, oats, and rye. 2. Fisheries and grazing.

IX. Commerce.

X. Waterways and landways: 24,000 miles of navigable rivers; Trans-Siberian railroad.

XI. People: 88,000,000. Government; compare with that of United States. Readings from Gogol's *Taras Bulba* and from Tolstoi's *Resurrection*.

References: Ballou, *Footprints of Travel;* Chisholm, *Handbook of Commercial Geography;* Reclus, *Bird's-eye View of the World;* Ibid, *Earth and Its Inhabitants;* Mill, *International Geography;* James Sime, *Geography of Europe;* Henty, *Lion of the North* (illustrative of the Thirty Years' War); F. W. Longman, *Frederick the Great and the Seven Years' War;* Yonge, *Young Folks' History of Germany;* Motley, *Rise of the Dutch Republic;* Wallace, *Russia*.

Number work: (Correlated with geography.) 1. The Haarlem engineers at a cost of $765,000 recovered from the sea an area of 15,000 acres. What did the work cost per acre?

2. The Volga from its source to its mouth is 1,005 miles as the crow flies; its actual length is 2,130. What is its average length per mile of distance?

3. The basin area of the Danube is 299,435 square miles. What per cent of the continent of Europe is this?

4. Europe has an area of 3,823,383 square miles. If the material of which the Alps are composed were spread equally over the surface of the continent the level would be raised 89 feet. How much material is there in the Alps? What is the average size of the eighteen countries of Europe?

5. Germany has an area of 133,695,000 acres, a population of about 50,000,000, and a forest area of 13,924,000 acres. How much arable land is there per person? What per cent of the land is covered by forest?

6. In 1787 there was said to be 144,000,000 people in Europe, and in 1874, 309,178,000. What was the average annual increase? At the same rate what would the population be now?

History: (TEUTONIC MIGRATIONS.) I. Locate the Teutons at home in the forests of Germany.

Have the children observe pictures of the country from geographical books and from the school picture collection. Infer the character of people in such an environment.

II. Read from the *Germania* of Tacitus a description of the Teutons.

III. Have the children place themselves in a similar environment, and reason out what their life would be. Take up the following points:

1. The village community.

2. The houses; the common land.

3. Appearance of the people; their dress; their arms.

4. The occupations; implements. Use pictures and sketches by the teacher to illustrate the above. Visit the museums.

5. The government: The village assembly; the growth of representation. Criminal law; "eye for eye"; the blood-wite; compensation by family. Class will read Chapter I in Green's *Short History of the English People*.

6. Classes of society: (a) chief; (b) nobles by birth, earls; (c) freemen, céorls; (d) slaves, prisoners of war or criminals.

IV. Rise of kingship.

The pupils will reason out the steps between the choosing of a strong man for leadership in war and the development of the kingship.

Read from Guizot's *History of France* the story of the *Vase of Soissons.*

V. Their contact with Rome.

Read Kingsley's myth of the Troll-garden, from *The Roman and the Teuton.* Recall the barbarian encounter with (1) Marius; (2) Cæsar; and discuss what the Teutons gained from Rome.

VI. Compare the Teutonic and the Roman principles of government.

VII. The Teutonic movements. The causes. Trace routes over Europe. From relief maps the class will judge what routes would be chosen.

VIII. The invasion of England.

References: Tacitus, *Germania;* Green, *History of the English People;* Kingsley, *The Roman and the Teuton;* Guizot, *History of Civilization;* Emerton, *History of the Middle Ages.*

French: Since Mlle. Ashléman is attempting to correlate French closely with other subjects, there will be no outline for this month—the work is too experimental to be forecast. Next month, however, Mlle. Ashléman will publish a report of her experiments in correlation.

Art: In connection with the history, the class will paint and draw pictures of some of the stirring scenes and events which occurred in the Gothic invasions of the Roman Empire.

Speech, Oral Reading, and Dramatic Art: We shall continue the study of Julius Cæsar begun in January. The relation of this drama to the history of Rome, in which the children are interested, need not be discussed, since it is in the spirit and atmosphere of the times. They read the play first for the story, just as we do, reading it many, many times. No attempt was made to get at the meaning of difficult words, phrases, or constructions. They told the story in as short a time as possible, speaking always to the whole school. Then followed discussions as to what were the essential parts of the story. The result was the story in its simplest form. When the children had written the story, they passed easily to a synopsis of the play. The study of character began unconsciously with the first readings. The children know the people in the play and the conditions under which they are acting. They are real men and women, real human beings. The class has learned to make comparisons, to draw inferences, to search for the motive of action, proving each statement or opinion by the text. They have learned to weigh the words of Brutus and the other men—when Brutus speaks alone in soliloquy and when he speaks to or of others. They judge in a measure by the public opinion—what other men say of him—and his own deliberate and impulsive acts.

By this study the greater part of the play has been read orally and the construction of the play is familiar to the children. In February, or as soon as they are ready for it, we shall prepare for dramatic presentation some of the great scenes, beginning with the first scene of the first act as an introduction, and passing on to the second scene.

Music: There is very little material for correlation in the subject-matter of the songs for these grades, and it is of far less importance here than in lower grades. This is partly because the children have already fixed habits of self-consciousness which make reference in an emotional form to what are to them the commonplaces of their lives seem forced and artificial. The chief reason, however, is that singing is above all a highly spiritual form of expression and tends naturally to get further and further away in its subject-matter from the concrete, and nearer the spiritual.

Songs of general import, ethical songs, and hymns are found most practicable for these children, and less attention is paid to expression of feeling than to simple matters of technique which tend to make the declamation of the song intelligent and in-

telligible. These are chiefly distinctions of enunciation and the taking of the breath in places which help to make the sense of the text clear.

A few of the boys have been excused from singing altogether on account of the change of voice. The children chosen for alto parts are not merely the musical ones who can do it easily, but those having alto voices, and those whose upper tones are in poor (not merely undeveloped) condition. A short review of Tyrolese and Highland songs and some Norwegian mountain-songs will be made in connection with the geography work. This will consist in listening to the songs played or sung for them and discovering their salient characteristics.

Songs: *Flag Song; Fatherland's Psalm*, February COURSE OF STUDY; *Hail, Columbia*, Modern Music Series, Second and Third Books; *The Hardy Norseman*, Modern Music Series, Third Book; *Morning and Night, The King of Love*, Songs of Life and Nature.

Algebra for the Seventh and Eighth Grades.

GEORGE W. MYERS.

62. If A denote the *amount*, P the principal, t the time in years, and r the rate, write an equation for A.

63. By dividing and transforming the latter equation, derive all the cases of simple interest.

64. Let P represent the principal, or the annual rate, t the number of years, I the compound interest, A the compound amount, and a the compound amount on one dollar. What is the amount for one year? For two years? For three years? For four years? Whence for t years it is Pa^t, or $A=Pa^t=P(1+r)^t$. Here give problems to show the efficiency of these equations.

NOTE.—The interest is supposed to be payable annually. What would the above equations become if the interest were payable quarterly?

Multiply 17 by 23 and notice carefully what operations you perform. You say 3 times 7 equals 21; then 3 times 1 ten equals 30 units; then 7 times 2 tens equals 140 units, and finally, 2 tens by 1 ten equals 200 units; then you add all these products, thus: $21+30+140+200=391$. These operations are more obvious by proceeding thus:

$$17=10+7$$
$$23=20+3$$

The products are then formed by multiplying both parts of 17 by 3, and then both parts by 20. These four partial products are then added to obtain the product of 17 by 23.

The problem might also have been solved thus:

$$17=20-3$$
$$23=30-7$$

Here we should first multiply 3 by 7, then 20 by 7, and subtract the former product from the latter. Then we should multiply 3 by 30 and 20 by 30, and again subtract the former from the latter. Finally we should subtract the first difference from the second, whence we should obtain the same result as before, viz., 391.

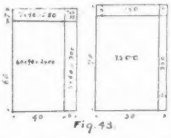


Fig. 43.

65. Apply both of these methods to 67×45, writing the problem first, $(60+7)\times(40+5)$, and second, $(70-3)\times(50-5)$, and compare the partial products in the first case with the parts of the first oblong and those of the second case with the parts of the second oblong in the cut.

66. Apply both methods to 54×36 and illustrate by diagrams as in 65.

67. Apply these methods to 56×96 and illustrate them by diagrams.

NOTE.—We see thus that $78\times63=(70+8)\times(60+3)=70\times60+70\times3+8\times60+8\times3=4914$, or that $78\times63=(80-2)\times(70-7)=80\times70-80\times3-2\times70+2\times3=4914$.

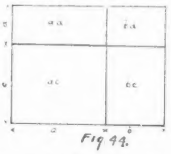


Fig. 44.

68. Show by referring to the diagram that $(a+b)\times(c+d)=ac+ad+bc+bd$.

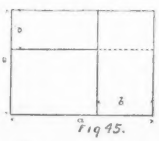


Fig. 45.

69. Show in the same way that $(a-b)\times(c-d)=ac-ad-bc+bd$.

Fig 46.

70. Draw a diagram and show by its aid that $(a+b)\times(c-d)=ac+bc-ad-bd$.

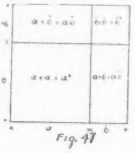
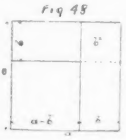


Fig. 47

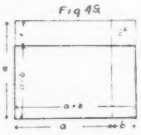
71. Referring to the adjoining figure, show that $(a+b)\times(a+b)=a^2+ab+ab+b^2$, or more briefly, $(a+b)^2=a^2+2ab+b^2$.

Fig 48



72. In the same way show that $(a-b)^2=a^2-ab-ab+b^2=a^2-2ab+b^2$.

Fig 49



73. Similarly that $(a+b)\times(a-b)=a^2-b^2$.

74. From 68 make a rule for multiplying the sum of any two quantities by the sum of any other two quantities.

75. From 69 write a rule for multiplying differences.

76. What rule can you make from 70 and to what form of numbers will it apply?

77. Make a rule from your solution of 71; of 72; of 73.

78. Test all the equations from 68 to 73, calling $a=27$, $b=24$, $c=15$, $d=8$.

79. The two sides of the triangle in the figure are equal. If the area of the triangle is t, what is the area of the square on either short side? Denote the square on either short side by a^2. What equation can you write between a^2 and t? Between a and t?

NOTE.—The square root of x is indicated thus $\sqrt{x}$ and read "square root of x."

80. Calling the square on the long side b^2,

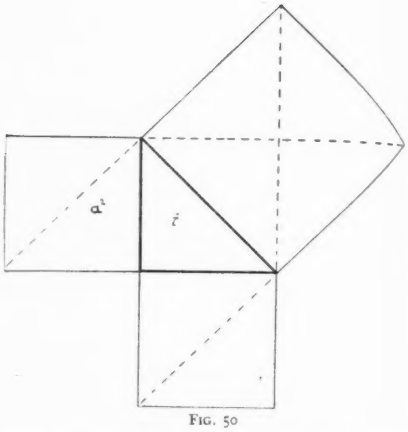


FIG. 50

what equation can you write between b^2 and t? Between b and t? From these two equations what third relation can you derive between a^2 and b^2? Between a and b? What relation is there between the squares on the three sides?

81. In the figure denote the sides of the right triangle by a, b, and c, and the areas of the various pieces by the letters which stand within them. Draw a figure such as the one indicated and cut along all dotted lines. See whether the pieces having the same letters will fit over

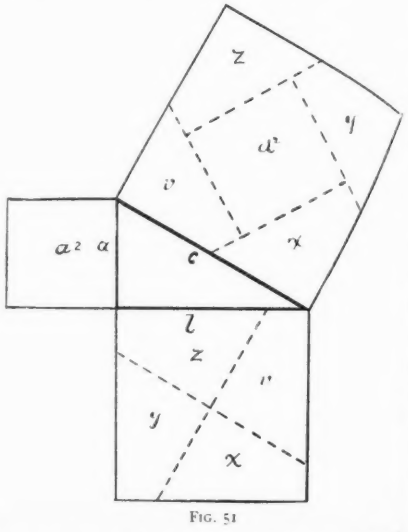


FIG. 51

each other. Denoting the square on a by a^2, on b by b^2, and on c by c^2, write an equation

expressing b^2 in terms of the parts into which you have cut it; another equation for a^2 and another for c^2. Add the values of a^2 and b^2, member to member, and compare the sum with the value of c^2. What principle can you discover for the sides of this triangle? Compare this principle with the result of the last exercise. Perform this experiment with more than one right triangle. Does the principle hold for triangles not right angled?

This is one of the most important principles of geometry and should be thoroughly understood.

82. Draw very accurately a number of right angled triangles, measure their sides and test the principle of Ex. 81.

Definition: The side opposite the right angle in a right angled triangle is called the *hypothenuse*.

It is known that the early Egyptians paved the floors of some of their buildings with isosceles right triangles. From this it has been suggested that the Egyptians knew this proposition for this special triangle. What do you think of the suggestion?

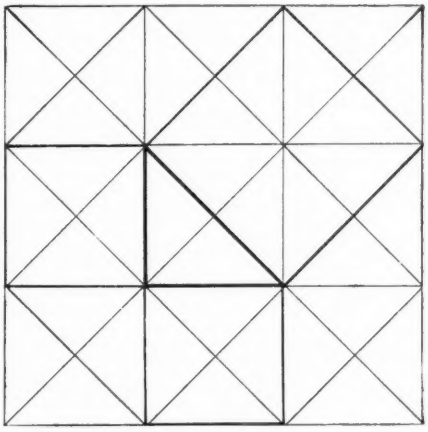


FIG. 52

The High School

Latin, Eighth and Ninth Grades: (ALLEN W. GOULD.) Lessons XII, XIII, and XIV, printed in the January COURSE OF STUDY, are simplified from Livy. The twelfth tells how the Roman matrons met by themselves and voted to give their ornaments to the treasury to pay a vow that had been made to Apollo. This story adds one more detail to the growing picture of the Roman matron. The pupils have seen her spinning and weaving the clothing of the family, and keeping her house with dignity and honor, as well as watching the omens and advising and encouraging her husband to do great deeds. Now the Roman matrons are seen to assemble by themselves and discuss the serious public matter of an unpaid debt to Apollo, and finally resolve that the debt shall be paid, and furnish the means for paying it.

The family life that made this high position of woman possible will seem perfectly natural to the students, because it is so much like our own modern home, and it may be necessary for them to see the position of the wife in Athens or in Asia at that time in order that they may appreciate the difference between the woman of the East and the woman of the West.

The maternal family as found among the American Indians, where the mother has to think and act almost wholly for herself and her children, can be described and contrasted with the Oriental family, where the wife is a cipher, and with the Roman and Anglo-Saxon family, where both husband and wife think and act. The pupils may then be asked which of these family types is the most helpful in making this world better. They may also be asked what danger there would be in the Roman family if both husband and wife thought for themselves. Would they be apt to think differently, and so divide the home?

How far would this danger be avoided by the law giving the husband supreme authority? The students can then be asked to watch the Roman family, as they see more of it, and find out whether it went to pieces.

This lesson also makes another addition to the pupils' ideas regarding Roman roads and carriages. The extreme rarity of wheeled vehicles in the city and the character of the streets will help to make the picture of Roman life more distinct, while the trip of Horace (Sat. I, 5) to Brundisium can be told briefly and so give distinctness to their idea of Roman traveling. They should make a map of southern Italy, putting in all the towns they know and connecting Rome with Capua, Beneventum, Brundisium and Tarentum by the Appian Way. They can measure the distances and calculate how long it would probably take Horace to make the journey, and their results can be compared with the actual time. The incidents of bad water, gritty bread, and smoky fire will help the students to realize the discomforts the Romans had to suffer as they traveled over the world to establish law and order.

In studying the construction of the Roman roads it may be well to begin by asking the class what they know about modern roads. The two or three individuals who seem most interested may be asked to report to the class what the best modern roads are and how they are built. Two other students may be asked to find out what they can about Appius Claudius Cæcus, the first road-builder. The rest of the class can be required to report on different parts of the ancient roads as found described in the references to the lesson. Throughout the whole study the function of the roads in bringing mankind together should never be lost sight of.

It might be well to have the pupils find out whether the United States, measured by days' journeys on the railroad, was larger or smaller than Italy, measured by days' journeys on foot or on horseback.

Lesson XIII gives the story of Horatius at the bridge, and so adds another important detail to the idea of the roads. Even the wooden bridges removed the barriers which the rivers offered to the coming and going of merchants and magistrates, but when the Romans found out how to use the arch, and threw the massive causeways of stone over the mighty streams, they helped the world to take one of its greatest steps toward the fellowship of all mankind.

The typical Roman is seen in Horatius, brave but prudent, pious but self-reliant. Some of the students will be asked to read the fuller account in Macaulay's well-known lay, while others report on the material found in the references given in the January COURSE OF STUDY and in Smith's *Dictionary of Biography* under Cocles.

Lesson XIV gives the story of Tarpeia's treachery, and reinforces the stern ideal of the Roman maiden, which the students have already seen in Virginia. It also shows another use to which the Romans put the arch in bringing streams of water into the heart of the city. This was a great step in the evolution of the city. Under the empire Roman law and Roman aqueducts enabled men to live together in health and harmony. Some of the students can report on the water systems of New York and Chicago, while others report on the material found in the references. The picture of the Greek girls gives a vivid idea of the way the water was carried before it was distributed among the houses and the way it was procured for some houses even in Rome, as the line from Plautus shows.

The story of the siege of the citadel will afford a good opportunity to tell the stu-

dents the primitive condition of the settlements on the seven hills as shown by recent excavations. Starting with this primitive picture, the history of the growth of the Roman state can be read in extracts from the *Vivi Romæ*, which it is expected the students will be able to read by the time they have finished these fourteen lessons.

At the Christmas festival one of the characters represented was Julius Cæsar in tunic and toga. These garments were made of wool, as nearly as possible like the Roman originals, the toga being an ellipse fifteen feet long by ten feet wide, the shape approved by Marquardt in his *Privatleben der Römer*. The Latin classes of the Ninth and Tenth Grades were present at the draping of the toga, so that they could realize what the wearing of the toga meant and understand why the Romans were so glad to escape it. There was no difficulty in reproducing the folds shown on statues not later than Cæsar's time.

Ninth and Tenth Grades

Latin: This class will continue the study of the influence of Rome upon modern Europe by reading Cæsar's *Gallic War*, I, 6-14. The students will investigate the composition of the Roman army and the form and meaning of the camp by using the reference already given in the COURSE OF STUDY for October (p. 177). The references will be distributed among the different members of the class, and some of the pupils may be asked to make wooden models of such parts of the Roman and Gallic armor as can be easily reproduced in the Manual Training room, so that they may be familiar with its size and weight, and realize how far it differed from our weapons of to-day. The students will also make maps of the country, to give them more definite ideas of the physical form of what is to be the scene of all European history.

Greek: The beginners in Greek will continue reading the conversations of Socrates simplified from Xenophon to get at Athenian thought, and the history of the Persian War in Moss' *First Greek Book* to learn the historic background; while the lessons in Atherton's *First Greek Book* will be kept up, to help in mastering the forms as described in the January COURSE OF STUDY (p. 475). The exact amount of ground we shall cover we cannot tell until we find how readily the different students assimilate the different ideas. In connection with this reading we shall take up the ritual and mythology of Greece as far as seems necessary to fill out the picture in the mind of the student.

German: (DR. SIEGFRIED BENIGNUS.) As these pupils are studying Greek history during this quarter, the work will therefore be the study of Athens under the administration of Pericles, illustrating the most prosperous time of Athens in political power, commerce, art, and literature, and the beginning of the Peloponnesian War. Only easy words and simple constructions with phrases will be used, so as to include suitable exercises in declension and conjugation of irregular verbs. The results of this historical study will be summarized by the pupils both verbally and in writing. In reading, Andersen's *Picture-Book Without Pictures* will be continued. The substance of the short stories after careful reading will be reproduced verbally by the pupils. As another means of strengthening oral expression, exercises in the language of everyday life will be conducted by having one pupil ask familiar questions, and another give the correct answer. The various German songs taught by the teacher of music have proved a welcome adjunct to the public performances of the school, such as Christmas and morning exercises. They

have also proved an effective means of correcting the defective pronunciation, especially of vowels. In February, Heinrich Heine's *Loreley* will be sung to the familiar melody of Friedrich Silcher. For memorizing, another poem of Heine's has been selected:

Du biſt wie eine Blume
So hold, ſo ſchön und rein.
Ich ſchau' dich an, und Wehmut
Schleicht mir ins Herz hinein.

Mir iſt, als ob ich die Hände
Aufs Haupt dir legen ſollt',
Betend, daß Gott dich erhalte
So rein, ſo ſchön und hold.

Heinrich Heine,
„Buch der Lieder".

Physiography: (WALLACE W. ATWOOD.) Ninth Grade — Shore Lines:

I. Observational work through study of maps, models, and pictures of the coasts of the Mediterranean Sea and other regions.

II. Classification of coast lines. Compare west coast of Italy, the Italian "foot," and coasts of Greece with northwest France, Belgium, and Holland.

III. Activities along shore lines.

1. Erosion, developing cliffs, caves, and terraces.

2. Transportation by waves, undertow, and littoral currents.

3. Deposition, developing terraces, beach ridges, barriers, bars, spits, hooks, loops, deltas, and dunes.

IV. Effects of depression. Study examples about Greece, west coast of Italy, Stockholm district, west Coasts of Scotland, and Norway, southern Sweden, Maine, and Puget Sound.

V. Effects of elevation. Study examples in Holland, Belgium, northwest France, Atlantic coastal plain of the United States, Texas, Mexico, Argentine Republic.

VI. Recognition of ancient shore lines by (1) cliffs, (2) terraces, (3) beach ridges, (4) deltas, (5) ramparts or bowlder walls, (6) fossils, (7) local water-worn gravels, (8) consistent horizontality of above features. Study examples about Chicago, Great Salt Lake, Utah, Lake Chelan, Washington.

VII. Settlement and development of civilizations along different coasts. Compare life of Greece with that of Egypt, of Phœnicia, of Holland, of the Atlantic coastal plains of the United States.

Art Expression: 1. Modeling in sand the Mediterranean region.

2. Modeling in chalk special coastal regions of Egypt, Greece, and Italy.

3. Painting with water-colors scenes typical of the Mediterranean region.

References: Davis, *Physical Geography;* Gulliver, *Shoreline Topography;* Geikie, *Elementary Lessons in Physical Geography;* Mill, *Realm of Nature.*

Mathematics: (GEORGE W. MYERS.) Geometry. These grades will continue their studies of type forms used in architectural construction. The geometrical forms used in Greek architecture will be given special attention, though the work will not be confined exclusively to such forms. The necessary facility in the use of drawing instruments and in the principles of geometrical construction will be secured through the drawing to scale of simple mosaic patterns, Greek frets, frescoes, and windows, and in designing other ornamental parts of buildings, using both assigned and original fundamental figures. The special topics of study will be:

1. Greek arches. a. The segmental arch (Fig. 37). b. Pointed horseshoe arch (Fig. 43). c. The equilateral arch (Fig. 44).

2. Gothic arch (Fig. 52).

3. Roman arch (Fig. 41).

4. Greek frets and borders (Figs. 18 and 19).

5. Panel doors (Fig. 42).

6. Ornamental patterns (Figs. 47, 48, 49, 51, 56, 57 and 58).

7. Frescoes, mosaics, and mosaic borders (Figs. 21 to 36, 38 to 40, 45 and 54).

8. Designs from assigned fundamental forms (Figs. 1 to 12, excepting 2).

9. Ornamental windows (Figs. 13, 14, 15, 45, 46 and 52).

10. Original geometrical designs.

Some time will be spent during the succeeding months in the manual training shop in the construction of simple astronomical apparatus, such as the sun-dial, gnomon, quadrants, etc.

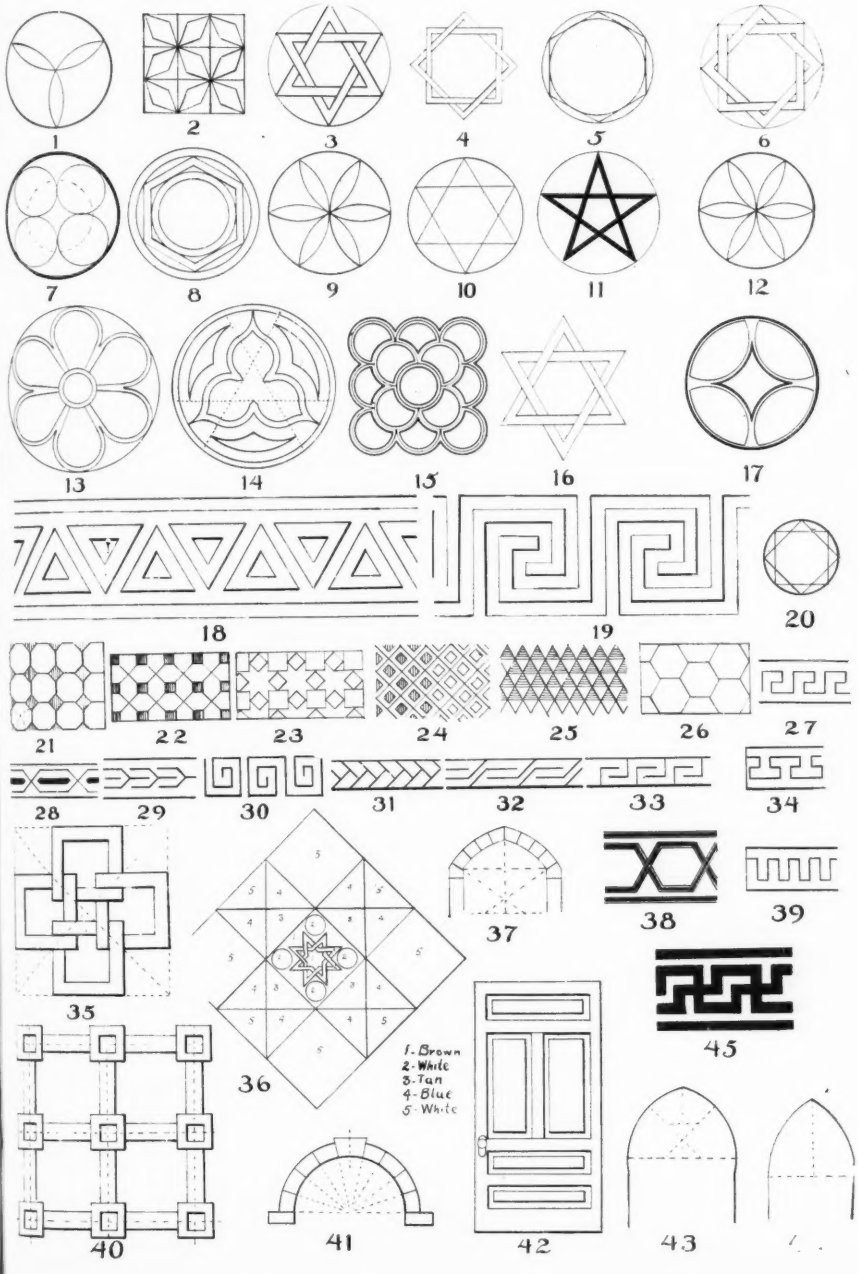
Eleventh and Twelfth Grades

General Geology: (WALLACE W. ATWOOD.) Eleventh Grade.

XIII. Alleghany Plateaus.

1. Location and physiographic boundary.

2. Topography. Its erosion history.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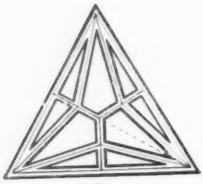
2-White
3-Tan
4-Blue
5-White



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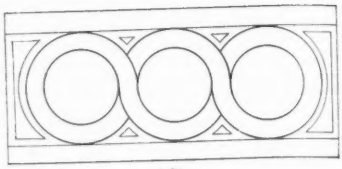

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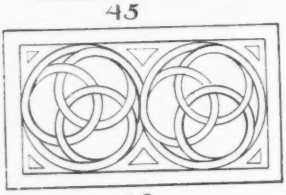

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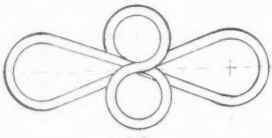

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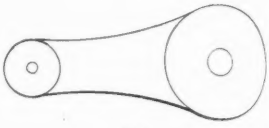

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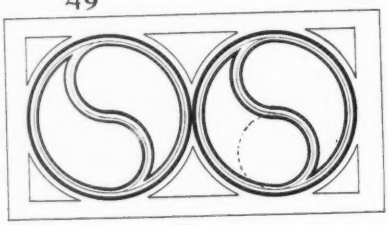

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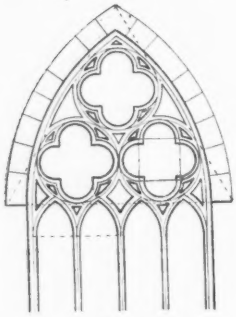

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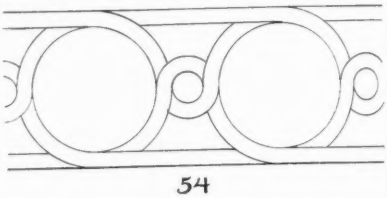

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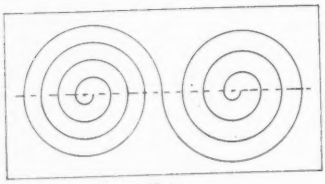

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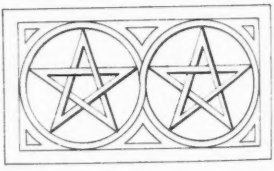

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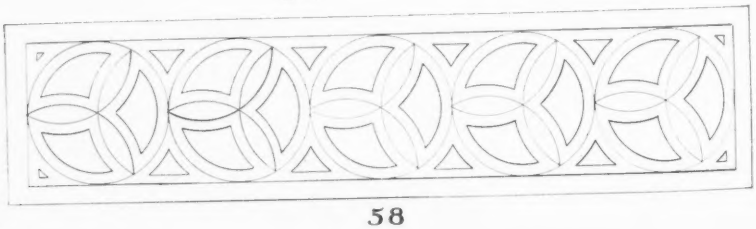

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3. Drainage.

4. Geological structure. The formations and the origin of their materials. Mineral wealth stored in these formations.

5. Settlement and development. (a) Migration into and through this belt. (b) Location of towns and villages. (c) Occupation of people to-day in the belt.

XIV. The Ozark Mountains. These will be treated in the same general manner as the Appalachians, or as the Alleghany plateaus.

XV. The prairies of the north central states.

1. Location and extent.

2. Geological formations underlying the region. (a) Origin of the material and nature of deposition. (b) Mineral wealth in these deposits. (c) The loose mantle of glacial drift. Its distribution, topography, topographic relations, constitution, structure, and origin.

3. The glaciers which brought the drift. (a) Formation and movement of. (b) Work of erosion, transportation, and deposition. (c) Erosion by glaciers. Influence on hills, on valleys, on rock surfaces. (d) Transportation by glaciers. How does a glacier get material? Where does it carry material? (e) Deposition by glaciers. Causes for deposition. Nature of deposition. (f) Depositional forms and how to recognize them in the field. The terminal moraine, ground moraines, outwash plains, kames, eskars, valley trains, and drumlins.

4. The glacial period. (a) The different epochs — how to prove them in the field. (b) Theories for explaining the ice age or glacial period.

5. Evidences of glacial periods in other countries and in other geological ages.

6. Settlement and development of the regions glaciated.

Art Expression: 1. Modeling in sand and chalk the areas under consideration.

2. Painting in water-colors typical scenes chosen from the regions studied.

References: Same as given in January number, together with physical, geological, and topographic maps.

Latin, Eleventh Grade: (ALLEN W. GOULD.) The students will continue the reading of Cicero's orations against Catiline, probably taking up the third and fourth this month in the way described in the January COURSE OF STUDY (p. 490), and with the references already given in the COURSE OF STUDY for October (p. 177), November (p. 225), and December (p. 317). We shall try to help the students to see that these orations really give us a glimpse of the Roman government in actual operation, so that they can understand how necessary it was for the executive to have public opinion to back him, both in the Senate and among the populace, — unless he would rule by force alone, — and how difficult it was thus to educate public opinion as the Roman Empire grew larger and its citizenship less homogeneous.

In this way the student will see why Cicero was banished, because he had not been able to carry public opinion with him, and why Cæsar prevailed, because he gave up the attempt to have the people educate themselves. Then the pupils will be ready to ask themselves which of these two forms of governments is absolutely indispensable, if men are to rule themselves; and which of them was possible in Cæsar's time.

Chemistry: (ALICE P. NORTON.) In order to make the work more tangible, and the substances investigated more real, considerable time has been taken during the last month in discussing the relation of the different gases of the atmosphere to the life of the plant. One exercise was spent, under the direction of the biology teacher, in the study of the structure of the leaf, with the aid of the microscope. The function of the plant as a purifier of the air has been emphasized, and attention called to the wonderful economy of nature, by which the waste products of animal life are utilized in the vegetable world, and prepared for the further use of man.

In connection with the study of the composition of the air, the test for carbon dioxide has been made in the rooms of the school building. The following simple method, which gives fair results, especially when the air is bad, was employed for this:

Procure bottles of the given sizes: 16-ounce, 10-ounce, 8-ounce, 6-ounce, and 4-ounce. Using a common hand syringe, pump into each the air to be tested till the bottles are filled. Add to each one-half ounce of lime-water (one tablespoonful), cork, and shake thoroughly. After five minutes examine, comparing carefully the turpidity of the lime-water in the different bottles. In sixteen ounces of air, of ordinary purity (four parts of CO_2 in 10,000), there will be enough CO_2 to render the lime-water milky. It will not become milky in the 10-ounce bottle unless there are 6 parts of CO_2 in 10,000. The following table, from Tracy, shows the amounts indicated:

SIZE OF BOTTLE.	AMOUNT OF LIME-WATER.	PARTS IN 10,000.
16-ounce.	½ ounce.	A little less than 4
10-ounce.	½ ounce.	A little more than 6
8-ounce.	½ ounce.	About 8
6-ounce.	½ ounce.	A little more than 10
4-ounce.	½ ounce.	A little more than 15

It is necessary of course to warn the pupil that the serious contamination of the air is not from the carbon dioxide, but that it is used as a convenient measure of the impurity.

Experiments have from time to time been assigned to individual pupils, who, after performing the work, have reported the results to the class as a whole. This has given practice in making clear, definite, intelligible statements, and has cultivated self-reliance. The subject of combustion was studied in this way, with the additional advantage that the class have been able to proceed more rapidly than they otherwise would.

In the January number it was stated that the best opportunity would be sought for the introduction of the conceptions of acid, base, salt. The question as to where the hydrogen came from, when it was prepared from sulphuric acid and zinc, led to the repetition of the experiment, using hydrochloric instead of sulphuric acid, and then to an examination of the symbols of the acids on the reagent bottles, with a consequent discussion of the meaning of acid.

After sodium was discovered in the ash of the leaf, the following experiment was performed by the teacher, and sodium hydrate was discussed as a typical base:

Make a small cylinder of wire gauze, twist fine wire about it, and close one end firmly. In it place a piece of metallic sodium as large as a pea, and close the open end as before. Attach the wire gauze cage firmly to the end of a piece of stout iron wire, and thrust it quickly into a water pan so that it will come directly under the mouth of a small bottle of not over 100 c. c. capacity, which has been previously filled with water and is held inverted in the pan. With a lighted match test the gas collected.

Some of the more rapid workers in the class will perform the following experiment to illustrate the formation of a salt:

Record carefully the readings of two burettes, containing respectively sodium hydrate solution and hydrochloric acid. Run out 20 c. c. of the hydrate into an evaporator. Add three drops of litmus solution. From the other burette add acid until the litmus changes to pink. Add from each burette until a point is reached where one drop from either will turn the solution blue or pink. The solution must finally be left pink. Again record the burette readings. Calculate how much hydrochloric acid is required to neutralize 1 c. c. of sodium hydrate.

Now take 5 c. c. of the hydrate. Add three drops of the litmus, as before. Calculate the amount of acid necessary to neutralize this amount and run in the calculated amount from the acid burette. This will test the accuracy of your former work.

To 25 c. c. of sodium hydrate in an evaporator add the amount of acid necessary to neutralize it completely and evaporate to dryness. Taste the residue.

Because of the introduction of the experiments here given, most of the work outlined for January will be done in February. If more time remains, it will be used in further discussion of these same subjects rather than in the introduction of new ones.

Some of the questions which will be used in written work are as follows:

1. On a certain railroad a tunnel lined with wood took fire from a spark from the locomotive. It was impossible to reach the flames with a hose. The authorities ordered the ends of the tunnel to be bricked up. Discuss whether this method should have been effective.

2. Given a bottle full of colorless gas. Upon testing it with a lighted wooden splinter the gas was found to support combustion. Lime-water was now added and turned milky. What was the original gas?

4. Why does blowing a flame sometimes put it out and sometimes make it burn more brightly?

4. Why does carbon dioxide often collect at the bottom of old wells, while in an ordinary room it is found distributed, or near the top? Give all the reasons.

Mathematics, 11th and 12th Grades: (GEORGE W. MYERS.) I. Applied Trigonometry. Plane trigonometry will be reviewed during February through a study of the stresses and strains in roof trusses, girders, cranes, and derricks.

The following topics will receive special attention:

1. Various forms of the simple crane (Figs. 1 to 3).
2. The derrick (Fig. 4).
3. Braces and tie-rods (Fig. 5).
4. The king-post truss (Fig. 6).
5. The inverted king-post truss (Fig. 7).
6. The queen-post truss (Fig. 8).
7. The inverted queen-post truss (Fig. 9).
8. The Burr truss (Fig. 10).
9. The Pratt truss (Fig. 11).
10. The Howe truss (Fig. 12).
11. The Warren girder (Fig. 13).

II. Field-work in plane surveying will be taken up as soon as the weather permits and

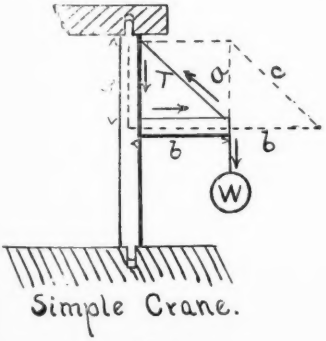


Fig. 1.

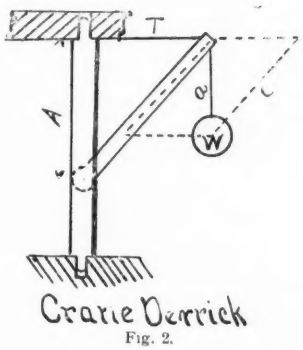


Fig. 2.

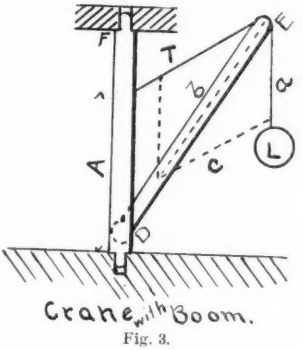


Fig. 3.

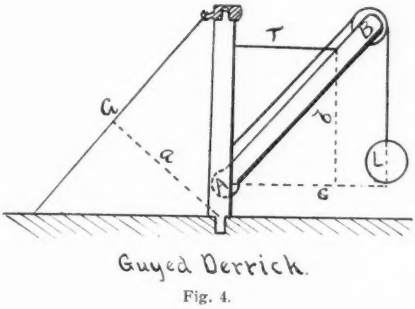


Fig. 4.

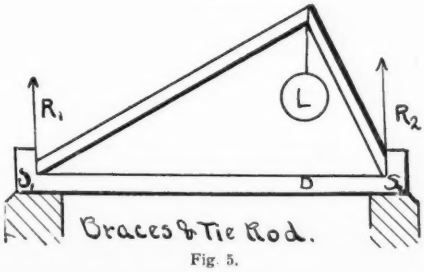


Fig. 5.

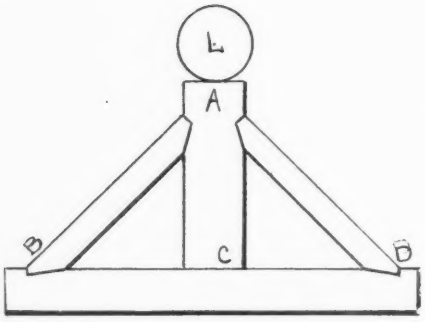


Fig. 6.

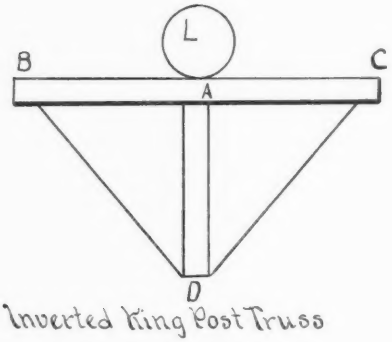


Fig. 7.

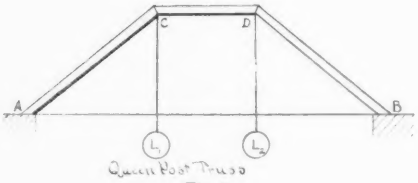


Fig. 8.

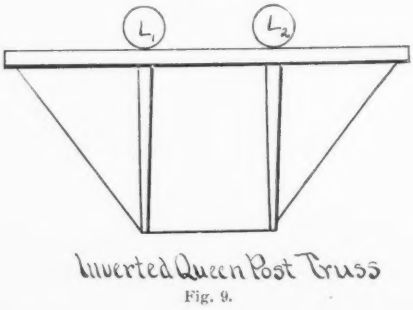


Fig. 9.

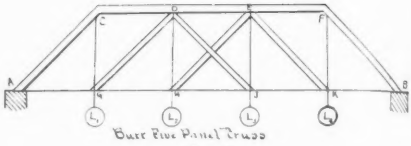


Fig. 10.

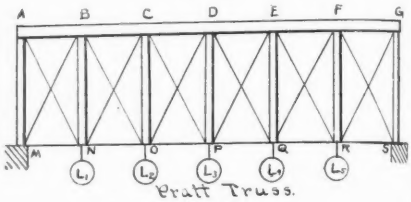


Fig. 11.

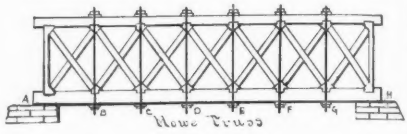


Fig. 12.

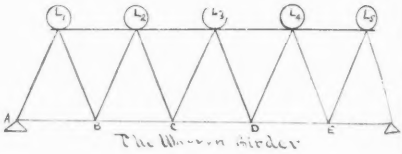


Fig. 13.

the subject of spherical trigonometry will be introduced through an examination into the instruments and methods used in our coast and geodetic surveys for running boundaries, mapping rivers, coast-lines, etc., where the curvature of the earth must be considered and allowed for.

III. The class will also begin plotting the graphs of the trigonometric functions. The equations to be plotted will be:

1. $y=\sin x$. 2. $y=\cos x$. 3. $y=\tan x$. 4. $y=\cot x$. 5. $y=\sec x$. 6. $y=\csc x$. 7. $y=\text{vers}\, x$. 8. $y=\text{covers}\, x$.

Twelfth Grade

History: (EMILY J. RICE.)

SUBJECT—The Critical Period of our History.

This is the period that shows to the best advantage the value of the union of the separate States into one strong nation.

We shall begin with a discussion of the possible methods of political organization and review the history of federal leagues in the past, and also the history of representative government in England and in the American colonies. This will show, by comparison, the nature of the English principle of government and the struggle between nationalism and particularism in a federal system. By considering the condition of the States under the Articles of Confederation, the pupils may be led to see the necessity for union, and may discover what each State must yield in order to make a union possible. It may be well to organize the class as the Federal Convention, with the pupils as representatives from the States. In this way each pupil will try to contribute the arguments that were made in some one of the different sections of the country for and against the Constitution, and in order to present these arguments he will find it necessary to consult various sources of information. He will need to understand the conditions of labor and trade in his particular section, the size of his State compared with that of other States, and the extent of the entire country with its relation to other countries. It will be necessary to know the feeling of the sections in regard to each other, and consequently to consider the modes of travel of the time and difficulties of communication. The recent troubles that had been caused by laws in regard to commerce with foreign nations, different trade laws between States, different kinds of money, and unsettled boundaries of States, are important because they taught the people the weakness of the general government and the consequent peril of the country.

After having studied the formation of our national government, the students may consider how they are being governed in the schoolroom, how much of their discipline is imposed upon them by some central authority, and how much of it is in their own hands. Possibly their interest in the analysis of this problem will aid them in managing their own schoolroom affairs. If they undertake to do this, some form of government must be selected. Constant comparisons may then be made between the forms selected by the pupils and those established in our local and national governments. A study of the Constitution of the United States will follow.

The study of United States history will be used throughout the year, as far as possible, to help the children in the solution of problems arising in their own actual experience. Important current events should be considered, especially those which refer to the industrial and political affairs of our own city and country.

Books of Reference: Fiske, *Critical Period of Our History;* McMaster, *History of the United States*, v. 1; Schouler, *History of the United States*, v. 1; Frothingham, *Rise of the Republic; The Federalist;* Hart, *Formation of the Union; Statesmen Series: Hamilton, Madison, Washington; American History Leaflets; Old South Leaflets;* Hart, *Source Book* and *American History Told by Contemporaries.*

German: (DR. SIEGFRIED BENIGNUS.) The recitations in literature of the advanced High School pupils have shown a deficient knowledge of versification. Only he who is familiar with the poetic form is able fully to understand the beauty of poetry, and to follow the innermost emotions of the poet. German genius has found high expression through rich and varied poetry clothed in the manifold native meters as well as in those of the cognate English, and in a characteristically flexible adaptation to all possible external forms in the simplest and most intricate structure of versification of the other civilized nations, such as the Greeks and Romans, the French, Italians, Span-

iards, and even the non-Europeans. The art of German versification gives excellent opportunity for observing the interrelations of German with English literature, and with the literatures of all other nations. To insert detailed outlines in the COURSE OF STUDY would require too much space. They will, therefore, be printed separately.

In the study of literature since October, the work on Schiller has been completed. So far as possible until the end of the school year, the pupils will be familiarized with the prominent writers of poetry and fiction as well as of scientific prose from the time of Schiller to the present day. The phases of the study to be pursued by the class are these:

I. Classic and Romantic School (1748–1848.)

(1) Independent contemporaries of the Classics.

(2) The Romantic School.

(3) The Earlier Romanticists.

(4) The poets of the Napoleonic War Period.

(5) The Suabian Circle of poets.

(6) Other Lyric poets allied with the Romanticists.

(7) The Drama since Schiller's death up to the thirties.

(8) The forerunners of Realistic poetry.

(9) The Newer Germany; political poets.

(10) The Later Romanticists of the forties.

(11) The scientific prose of the Romantic epoch.

II. Modern poetry; transition to and struggle for new ideals (since 1848).

(1) Different suppositions and principles in literature.

(2) Transitions from classic-romantic to modern poetry.

(3) The poetic Realism; modern poets.

(4) German literature since 1870.

(5) The scientific prose since 1848.

February will be taken up with the contemporaries of Göthe and Schiller: Johann Peter Hebel, Jean Paul, Friedrich Hölderlin, Friedrich von Matthison, Johann Gottfried Seume, August Wilhelm Iffland, August Kotzebue, Immanuel Kant, Wilhelm and Alexander von Humboldt, Georg Forster, Karl Ritter, Johannes von Müller, Christian Gottlob Heyne, Friedrich August Wolf; and the views of the romanticists and their contributions to the spiritual life in Germany. The reading matter will be taken from these writers.

To correlate with the special subject of the High School during February, the War of Independence will be studied, illustrating (1) cause, (2) important generals and battles, (3) attitude of the European powers, (4) results. The pupils will report on the matter in writing and verbally, thus furnishing opportunity for correcting mistakes in grammar.

For memorizing, the poem "Möven," in free rhythm, has been selected.

Möven.

Schwebend, kreisend eilt ihr Möven
Stetig hinterm Schiffe her.
Weit vom Lande es begleitend,
Fern vom Lande es begrüßend,
Seid ihr stets willkomm'ne Gäste,
Die der Wand'rer freudig schauet,
Weiße Möven, Meerbegleiter!

Schwebend, kreisend eilt ihr Möven
Stetig hinterm Schiffe her.
Morgens, wenn die Sonne steiget,
Seid ihr da. Wie Lichtgesandte
Schwebt ihr in der Ätherhöhe.
Wiederum im Abendleuchten
Eilt ihr, wo des Horizontes
Strich die dunklen Wasser scheidet
Von der Flammenglut des Himmels,
Segelt eilig hin und schwindet —
Dunkelschatt'ge Abendvögel,
Leichtbeschwingte Abendgeister,
Die der Ruh' entgegeneilen,
Ruh' auf felsigem Küstenstrand.

Weiße Möven, schöne Segler,
Seid ihr freundliche Gedanken,
Die die Lieben nach uns sandten
In verkörperten Gestalten?
Seid ihr freundliche Gedanken,
Welche uns entgegeneilen,
Schwingen breiten, Arme breiten
Aus dem Lande uns'rer Zukunft,
Aus dem Lande uns'rer Hoffnung,
Aus dem Land Amerika?

Wilhelm Benignus,
Aus Copyright „Meerlieder".

References for the study of Schiller begun in October: Schiller's life and works (only a few of the most important can be given here). Wychgram, **Schiller,** 1895 (numerous authentical illustrations); Deutsche Verlags

Anstalt, **Schillers Werke,** illustrated by the best German artists; J. Minor, **Schiller, sein Leben und seine Werke,** 1890; Otto Lyon, **Schillers Leben und Werke,** 1890; Otto Brahm, **Schiller,** 1888; C. Hepp, **Schillers Leben und Dichten,** 1885; Heinrich Düntzer, **Schillers Leben,** 1881; August Spiess, **Schillers Leben und Dichtungen;** Emil Palleske, **Schillers Leben und Werke,** 1858, especially new edition 1891; Gustav Schwab, **Schillers Leben,** 1840; Karl Hoffmeister, **Schillers Leben, Geistesentwickelung und Werke im Zusammenhang,** 1838—42; revised edition by Heinrich Viehoff, 1888; Karoline von Wolzogen, **Schillers Leben,** compiled from the recollection of the family, his own letters, and the communication of his friend Christian Gottfried Körner; Hermann Kurz, **Schillers Heimatjahre** (a novel containing poetry and truth); Moritz Zille, **Schillerhalle,** 1870, best thoughts from Schiller's works and letters, alphabetically arranged; Ludwig Rudolph and Karl Goldbeck, **Schillerlexikon,** 1869; H. Viehoff, **Schillers Gedichte erlautert und auf ihre Quellen zurückgeführt,** 6th edition, 1887; H. Düntzer, **Schillers Gedichte erlautert,** 3rd edition, 1888—91. A copious catalogue of the Schiller literature to present time gives M. Koch in vol. V of the second edition of **Gödekes Grundriß.** Carlyle, *Life of Schiller*, an examination of his works, 1825; E. L. Bulwer, *Life of Schiller* (introduction to the translation of Schiller's poems); Sime, *Life of Schiller;* English edition of Schiller's works (selection) by Morrison, Coleridge, Bulwer, Churchill and others (Philadelphia); Poems by Edgar Bowring, Bulwer, Merivale, Swanwick, Wireman (Philadelphia); selections by Turner and Morshead and Vernon; *Song of the Bell*, by Arnold Forster (Bradford); **Wallenstein,** by Coleridge, Lockhart; **Maria Stuart, Jungfrau von Orleans** and **Tell** by Pearson.

Music: (HELEN GOODRICH.) The High School is working upon three-part rounds, canons, and hymns, and will this month take up some more difficult part-songs. The basses have special drill once a week. The work of the class is directed chiefly toward improving the singing in morning exercises.

High School and Ensemble Songs: *Flag Song*, February COURSE OF STUDY; *Hail Columbia*, Modern Music Series, Second and Third Books; *Fatherland's Psalm*, Grieg, Seven Children's Songs (Augener & Co.); *The King of Love*, Songs of Life and Nature; *Little Rosebud*, Nursery Rhymes, Brahms (Augener & Co. Reprinted in Silver Song Series, No. 2, Silver, Burdett & Co.); *The Hardy Norseman*, Modern Music Series, Third Book; *Morning and Night*, Songs of Life and Nature.

Morning Exercises

FEBRUARY	SUBJECT	LEADER
1.	Preservation of Foods	Mrs. Norton.
5.	What the Books Say	Miss Warren.
6.	Book Illustration	Miss Simpson.
7.	Primary Music	Miss Allen.
8.	Alice Cary	Miss Van Hoesen.
13.	Lincoln	Miss Rice.
14.	Valentine's Day	Miss Mitchell.
15.	Mother Goose	High School.
19.	Current Events	Miss Baber.
20.	Lowell	Mrs. Thompson.
21.	Washington	Mrs. Atwood.
26.	Star Land	Mr. G. W. Myers.
27.	Longfellow	Mr. Gould.
28.	Music of Different Nations	Miss Payne.

Historical Events and Birthdays

February	3	Felix Mendelssohn	1729
"	7	Charles Dickens	1812
"	10	Treaty of Paris Closed French and Indian War	1763
"	12	Abraham Lincoln	1809
"	12	Chas. Darwin	1809
"	12	Alice Cary	1820
"	15	Galileo	1564
"	18	Charles Lamb	1775
"	19	Copernicus	1473
"	22	George Washington	1759
"	22	James Russell Lowell	1819
"	22	Florida Ceded to U. S. by Spain	1819
"	23	George Friedrich Handel	1684
"	24	Robert Fulton	1765
"	26	Victor Hugo	1802
"	27	Henry Wadsworth Longfellow	1807

Fatherland's Psalm

GRIEG.

Andante Religioso.
Oh God of Hosts, with Thy strong hand pro -
f
tect our homes and Fa - ther - land! Be Thou our shield in
ff
ff
Ped.
dim.
war or peace, and guide our steps till life shall cease.
dim

De - fend, O God, this land of ours, its
f
crag - gy shores, its moun - tain tow'rs, And may Thy glo - ry
ff
ff
Ped.
ev - er shine up - on this joy - ous land of Thine.
dim.
dim

Teach us in truth and light to grow, Thy
f
ff
laws to love, Thy word to know, In Thee we will for
ff
Ped.
dim
aye a - bide, oh King of glo - ry, be our guide.
dim

Flag Song*

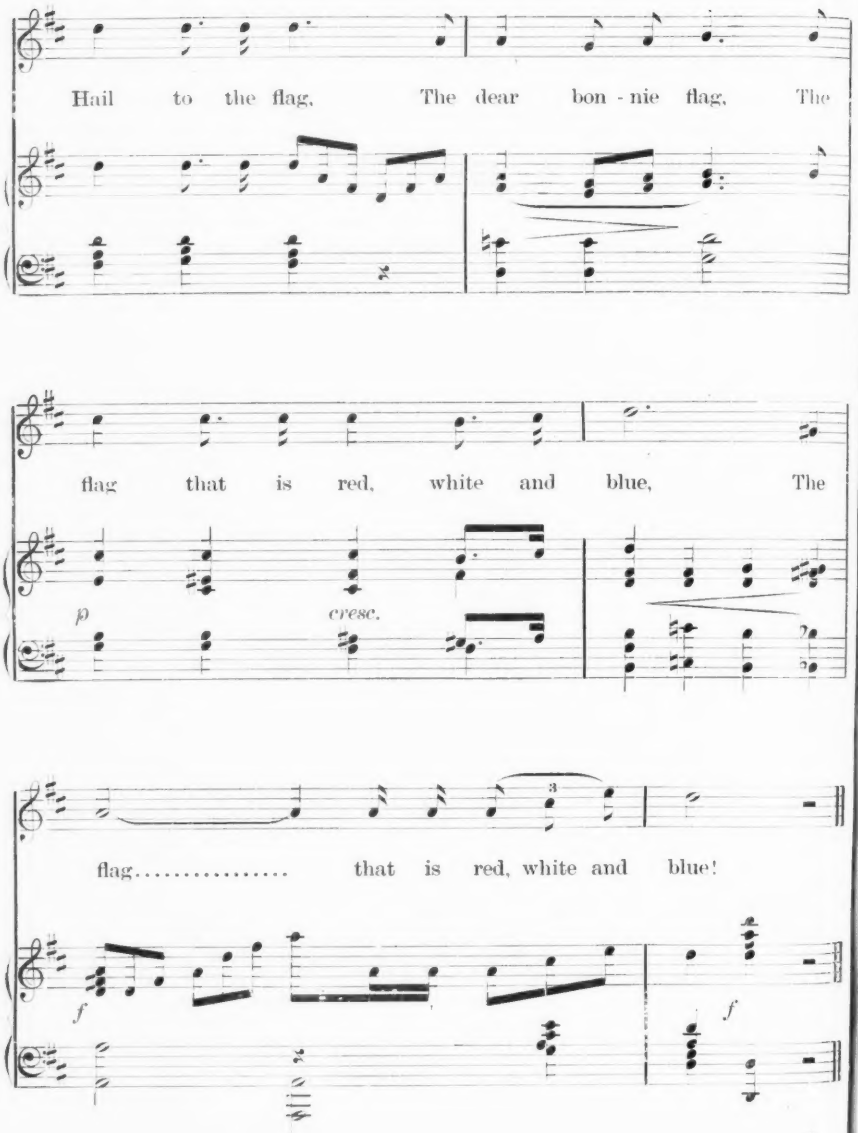
LYDIA AVERY COONLEY. FREDERIC W. ROOT.

March time.

1. Out on the breeze,
2. O - ver the brave
ff
p
O'er land and seas, A beau - ti - ful ban - ner is
Long may it wave, Peace to the world ev - er
stream - ing. Shin - ing its stars,
bring - ing, While to the stars,
sempre staccato.

*From "Singing Verses for Children", by permission.

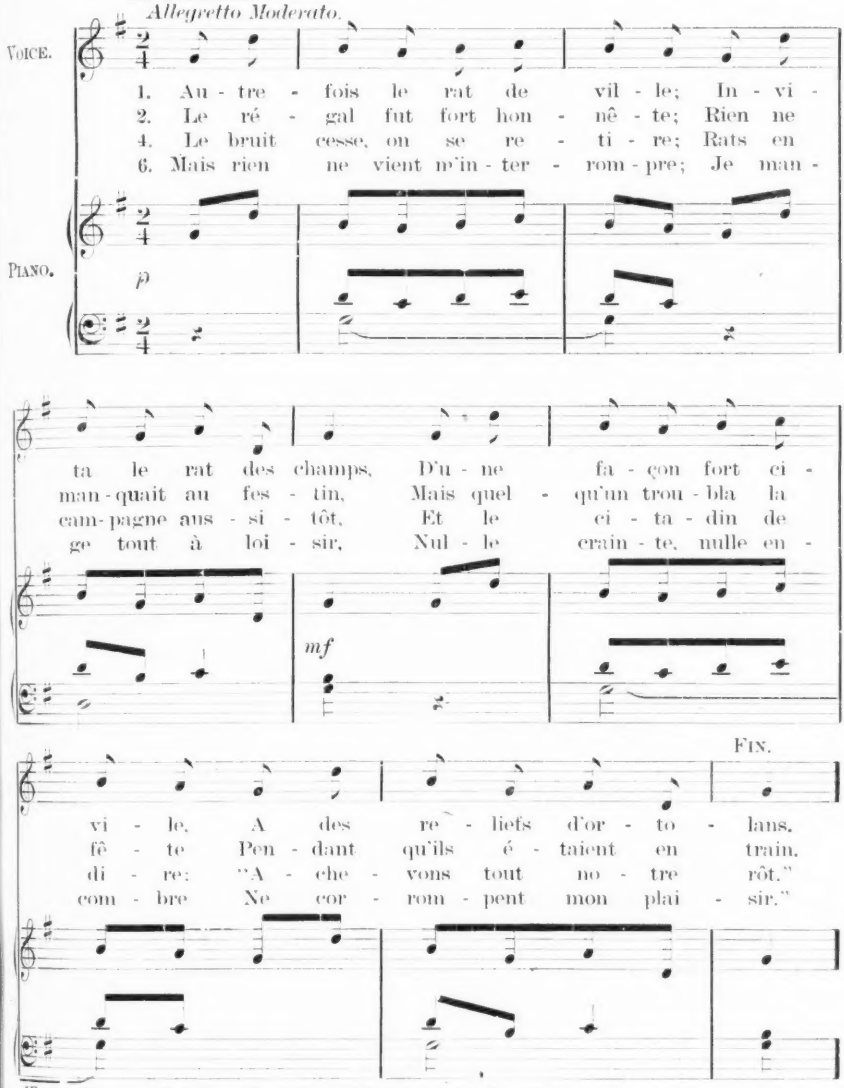
Splen - did its bars,
Un - der the sun - shine 'tis
Linked with the bars,
Hearts will for - ev - er be
mf
gleam - ing.
sing - ing
Hail! all hail! Hail to the flag; ...
fz
fz


Hail to the flag, The dear bon - nie flag, The
flag that is red, white and blue, The
p
cresc.
flag..... that is red, white and blue!
f
f

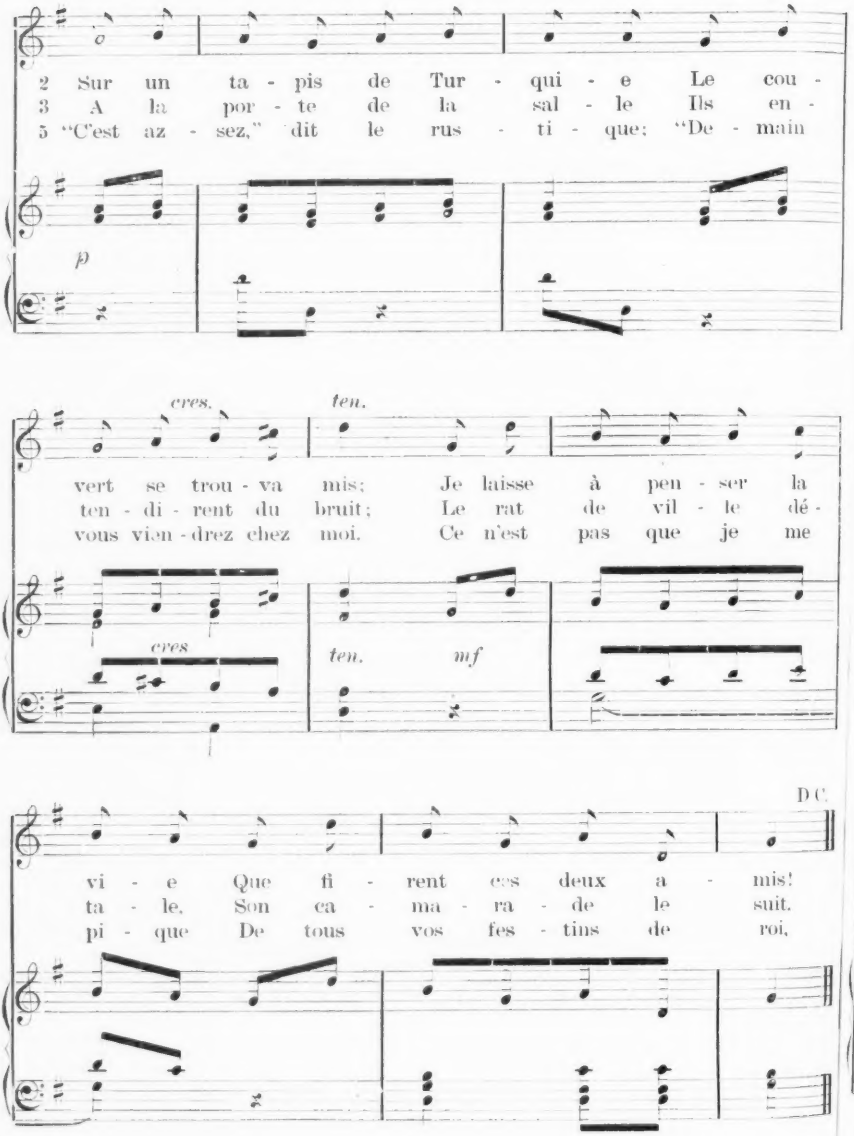
Autrefois le Rat de Ville *

LA FONTAINE.

Allegretto Moderato.


VOICE.
PIANO.
p
1. Au - tre - fois le rat de vil - le; In - vi -
2. Le ré - gal fut fort hon - nê - te; Rien ne
4. Le bruit cesse, on se re - ti - re; Rats en
6. Mais rien ne vient m'in - ter - rom - pre; Je man -
ta le rat des champs, D'u - ne fa - çon fort ci -
man - quait au fes - tin, Mais quel - qu'un trou - bla la
cam - pagne aus - si - tôt, Et le ci - ta - din de
ge tout à loi - sir, Nul - le crain - te, nulle en -
mf
FIN.
vi - le, A des re - liefs d'or - to - lans.
fê - te Pen - dant qu'ils é - taient en train.
di - re: "A - che - vons tout no - tre rôt."
com - bre Ne cor - rom - pent mon plai - sir."

*From "Chansons, Poésies et Jeux Français" by Agnes Godfrey Gay.


2 Sur un ta - pis de Tur - qui - e Le cou -
3 A la por - te de la sal - le Ils en -
5 "C'est az - sez," dit le rus - ti - que; "De - main
p
cres.
ten.
vert se trou - va mis; Je laisse à pen - ser la
ten - di - rent du bruit; Le rat de vil - le dé -
vous vien - drez chez moi. Ce n'est pas que je me
cres
ten.
mf
D.C.
vi - e Que fi - rent ces deux a - mis!
ta - le, Son ca - ma - ra - de le suit.
pi - que De tous vos fes - tins de roi,

Doll's Cradle Song

REINECKE.

Andantino.

Sleep, Dol-ly, sleep, soft - ly re - pose, Sleep, Dol-ly, sleep, your
p
Ped. * Ped. * Ped. *
lit - tle eye-lids close; While in school I am sigh-ing, You in bed are ly-ing,
3
3
Ped. * Ped. *
And have all the day, Time e - nough for play. Sleep, Dol-ly, sleep,
pp
Ped. *

Soft - ly re - pose, Sleep, Dolly, sleep, your lit - tle eye - lids close.
Ped.
Ped.
Hush, my pretty, go to sleep, While I sing you of the sheep, And the lambs that
p
night-ly wander, In the dark sky - mea - dows yonder, Sleep, my Dolly, sleep.

Reading List for February

Abraham Lincoln

FEBRUARY 12, 1809—APRIL 15, 1865

Biography and Criticism

Blaine. ..... *Presidents Lincoln.* (See his *Twenty Years of Congress*, pp. 215-549.)
Bolton. ..... *Abraham Lincoln.* (See her *Lives of Poor Boys Who Became Famous*, pp. 342-367.)
Ellis. ..... *Abraham Lincoln.* (See his *Makers of Our Country*, pp. 164-172.)
Hapgood. ..... *Abraham Lincoln; the Man of the People.*
Holland. ..... *Life of Abraham Lincoln.*
Johnson. ..... *Short History of the War of the Secession.*
Mabie. ..... *Abraham Lincoln.* (See Warner, *Library of the World's Best Literature*, v. 23, pp. 9059-9064.)
McClure. ..... *Anecdotes of Abraham Lincoln and Lincoln's Stories.*
Morse. ..... *Abraham Lincoln.*
Phillips. ..... *Abraham Lincoln.* (See his *Speeches*, 2d series, pp. 446-453.)
Phillips. ..... *Lincoln's Election.* (See his *Speeches*, 1st series, pp. 294-318.)
Tarbell. ..... *Life of Abraham Lincoln.*

Speeches

Lincoln. ..... *First Inaugural Address.* (See Johnston, *American Orations*, pp. 16-31.)
Lincoln. ..... Same. (See Warner, *Library of the World's Best Literature*, v. 23, pp. 9070-9074.)
Lincoln. ..... *Speech at the Cooper Institute.* (See Warner, *Library of the World's Best Literature*, v. 23, pp. 9066-9069.)
Lincoln. ..... *Gettysburg Address.* (See Johnston, *American Orations*, v. 4, pp. 123-124.)
Lincoln. ..... *Inaugural Speeches; the Emancipation Proclamation and Other Speeches.* (In *Old South Leaflets*, v. 1, No. 11.)
Lincoln. ..... *On His Nomination to the United States Senate.* (See Johnston, *American Orations*, v. 3, pp. 168-183.)
Lincoln. ..... *On the Dred Scott Decision.* (See Johnston, *American Orations*, v. 3, pp. 154-167.)
Lincoln. ..... *Perpetuation of Our Political Institutions.* (See Warner, *Library of the World's Best Literature*, v. 23, p. 9065.)
Lincoln. ..... *Second Inaugural Address.* (See Johnston, *American Orations*, v. 4, pp. 125-128.)
Lincoln. ..... Same. (See Warner, *Library of the World's Best Literature*, v. 23, pp. 9075-9076.)
Lincoln and Douglas. *First Lincoln and Douglas Debate.* (In *Old South Leaflets*, v. 4, No. 85.)
Douglas. ..... *The Lincoln-Douglas Debate.* (See Johnston, *American Orations*, v. 3, pp. 184-207.)
Lincoln and Douglas. *Political Speeches and Debates*, 1854-1861.

Illustrative Fiction and Poems

Eggleston. ..... *The Graysons.*
Holmes. ..... *Memorial Verses.* (See his *Poetical Works*, v. 2, pp. 266-267.)
Lowell. ..... *Ode Recited at the Harvard Commemoration.* (See his *Complete Poems*, p. 400.)

St. Valentine's Day

FEBRUARY 14

Origin and Observance

Beard and Beard. .... *St. Valentine's Day.* (See their *American Girls' Handy Book*, pp. 464-468.)
St. Valentine's Day... (See Chambers' *Book of Days*, v. 1, pp. 255-257.)
Thorne. ..... *Who Began It? St. Nicholas*, v. 3, pp. 258-259.

Stories

Coolidge. ..... *Blue and Pink. St. Nicholas*, v. 2, pp. 245-248.
Coolidge. ..... *How St. Valentine Remembered Willy. St. Nicholas*, v. 1, pp. 218-221.
Flint. ..... *Lady Ann's Valentine. St. Nicholas*, v. 9, pp. 303-306.
Swett. ..... *A Queer Valentine. St. Nicholas*, v. 10, pp. 243-247.

Poems

Cloud. ..... *Ye Valentine. St. Nicholas*, v. 26, p. 312.
Kellogg. ..... *Sending a Valentine. St. Nicholas*, v. 9, p. 266.
Poulsson. ..... *St. Valentine's Day.* (See her *In the Child's World*, pp. 191-196.)
Wyeth. ..... *Sweetheart's Valentine. St. Nicholas*, v. 1, p. 217.

George Washington

Biography and Criticism

FEBRUARY 22, 1732—DECEMBER 14, 1799

Washington. ..... (See Chambers' *Book of Days*, v. 1, pp. 284-286.)
Girault. ..... *Vie de George Washington.*
Guerber. ..... *Washington's Boyhood.* (See her *Story of the Thirteen Colonies*, pp. 191-199.)
Irving. ..... *Life of George Washington.*
Irving and Fisher.... *Washington and His Country.*
Lodge. ..... *George Washington.*
Poulsson. ..... *Washington's Birthday.* (See her *In the Child's World*, pp. 197-200.)
Scudder. ..... *George Washington; an Historical Biography.*
Smith. ..... *Story of Washington.*
Sparks. ..... *Life of Washington.*
Tomlinson. ..... *Mother of George Washington.* (See his *Stories of the American Revolution*, pp. 55-62.)
Uncle Junivell. ..... *Farmer Boy and How He Became Commander-in-Chief.*
Wiggin and Smith. . *Little George Washington.* (See their *Story Hour*, pp. 115-132.)

Addresses and Letters

Account of the Army at Cambridge. (In *Old South Leaflets*, v. 2, No. 47.)
Address to Congress on Resigning His Commission. (In Lodge, *Story of the Revolution*, v. 2, pp. 261-262.)
Addresses to the Churches. (In *Old South Leaflets*, v. 3, No. 65.)
Farewell Address. (See Warner, *Library of the World's Best Literature*, v. 38, pp. 15667-15682.)
Farewell Address. (In *Old South Leaflets*, v. 1, No. 4.)
Journal of His Tour to the Ohio. (In *Old South Leaflets*, v. 2, No. 41.)
Inaugurals. (In *Old South Leaflets*, v. 1, No. 10.)

Letter to Benjamin Harrison and Other Papers. (In *Old South Leaflets*, v. 1, No. 17.)
Letters of Washington and Lafayette. (In *Old South Leaflets*, v. 4 No. 98.)
Letters on the Constitution. (In *Old South Leaflets*, v. 4, No. 99.)
Washington's Legacy. (In *Old South Leaflets*, v. 1, No. 15.)
Words on a National University. (In *Old South Leaflets*, v. 4. No. 76.)

Illustrative Fiction and Poems

Cooper. . . . . *Lionel Lincoln.*
Cooper. . . . . *The Spy.*
Holmes. . . . . *Ode for Washington's Birthday.* (See his *Earlier Poems*, pp. 242-244.)
Lowell. . . . . *Under the Old Elm.* (See his *Poetical Works*, v. 4. pp. 74-89.)
Mitchell. . . . . *Hugh Wynne.*
Thackeray. . . . . *The Virginians.*

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